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Information Technology Strategic Plan

Fiscal Years 1997-2001

Information Resources Division

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

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1. EXECUTIVE SUMMARY

The mission of the TNRCC as shown in the *TNRCC Strategic Plan Fiscal Years 1997-2001* (TNRCC Strategic Plan) is: "The Texas Natural Resource Conservation Commission strives to protect our state's precious human and natural resources consistent with sustainable economic development. Our goal is clean air, clean water and safe management of waste with an emphasis on pollution prevention. We are committed to providing efficient, prompt and courteous service to the people of Texas, ever mindful that our decisions must be based on common sense, good science and fiscal responsibility."

Information Technology (IT) Goals

The *TNRCC Information Technology Strategic Plan for Fiscal Years 1997-2001* (IT Strategic Plan) fully supports the TNRCC IT Vision, the TNRCC Strategic Plan, and the Department of Information Resources (DIR) *Facing the Future: A Vision for Information and Technologies to Serve Tomorrow's Texans*. Goals and objectives for these plans may be found in Appendix A (TNRCC) and Appendix E (DIR). Detailed in Section 4 of this IT Strategic Plan are these three IT goals and supporting objectives:

Goal 1 Improve the TNRCC IT Infrastructure.

- Replace 30 percent of obsolete IT infrastructure each year.
- Establish a new information technology security program to bring the TNRCC into compliance with the Texas Administrative Code 201.13(b).
- Resolve the Year 2000 date problem by the end of 1999.
- Provide reliable, timely access to the agency's records.

Goal 2 Facilitate the alignment of IT goals with the TNRCC, state, and federal goals.

- Increase business program area and executive management involvement in IT planning and decision-making processes.
- Expand Information Engineering methodologies into TNRCC programs.

Goal 3 Provide integrated and electronically accessible data.

- Ensure all IT development projects include both electronic reporting and public access to data as appropriate.

TNRCC Information Technology Vision

The TNRCC will continue its leadership in the application of ongoing advances in information technologies to enable an integrated, seamless, and highly productive use of data to deliver high-quality information services for both employees and citizens of Texas. The TNRCC is committed to providing information technologies and services that support the agency's mission in an efficient, prompt, and courteous manner.

In the broadest sense, the five-year strategic plan for information technologies within the TNRCC is to align today's emerging information technologies to support the scientists, engineers, administrators, and the constituents of the agency in meeting the stated goals of Texas, the TNRCC, and DIR in a proactive and professional manner.

Strategically, the TNRCC is applying integrated computer-assisted software engineering (I-CASE) methodologies in re-engineering its information systems to increase the productivity of its programs and services. A major technology transfer is being made through I-CASE that enables program professionals working in joint application development teams to design and develop information systems electronically, with automatic error-free computer generation of computer programs. This significant paradigm shift also enforces the reuse of data models, process models, and presentation standards (templates) in other TNRCC programs to provide the same "look and feel" for computer screens and program-related functions.

Importantly, the program data is subjected to consistent editing and quality assurance before placement into a central, agency-wide relational database or repository. This repository also contains all the data models, process models, metadata, and developmental standards that are reused in all appropriate TNRCC information systems. The normalized TNRCC data is recorded once and reused in various systems. The repository provides the data for statistical analysis and graphical representation of program trends and activities.

Numerous projects to improve operational processes are in progress today. Over the next three years, processes scheduled for re-engineering will result in a significant shift to electronic reporting of quality data. As TNRCC information reporting is transformed from paper to electronic media using the Internet and Electronic Data Interchange (EDI) formats, the velocity of information flows will dramatically increase within the agency, and to and from the regulated community, other agencies, and the citizens of Texas.

Several new initiatives to build fully-integrated geospatially-based data management systems will be continued into this planning cycle. Single facility identification with latitude and longitude coordinates are designed to interrelate information on multiple program activities for a wide range of visualization and tracking information needs. The I-CASE methodologies enable important technical and data management standards to be established, enforced, and reused in all related systems. These initiatives will result in significant productivity gains within the various TNRCC programs and operations, and make environmental data readily accessible to a large population.

The TNRCC strategy for meeting the Year 2000 threat is to integrate the detailed risk assessment into our information protection risk assessment program and to integrate the actual changes that correct date-handling problems in our information systems into the thorough restructuring of our information technology environment that we are undertaking. The three major elements of our strategy are to replace our information technology infrastructure on a regular schedule, to re-engineer our applications and databases using the Information Engineering methodology and the I-CASE tool Composer, and to systematically test as many elements of our IT infrastructure as we can for "Year 2000 Compliance." We expect this strategy, applied to agency business systems in priority order, to secure the most important systems against the Year 2000 threat. We expect many smaller systems to be corrected by the same program personnel who built them, or in the case of embedded systems such as laboratory instruments and environmental monitoring equipment, by their manufacturers. We also expect that some systems will fail, and we are planning for the recovery activities that will ensue.

2. INTRODUCTION

Background

In February 1996, the TNRCC hired the Chief Information Officer (CIO) as the executive manager for IT. The CIO's specific responsibilities include:

- developing a comprehensive approach to planning and managing information technology (IT) investments to support the TNRCC's mission and priorities;
- providing broad oversight of information systems and processes across the agency;
- leading in planning and coordinating the acquisition of IT resources to carry out cross-functional programs;
- establishing and monitoring agency-wide use of general information technology policies, architectures, and standards to achieve interoperability, interconnectivity, and security in information resource management;
- assisting program organizations in planning and implementing their IT activities; and
- balancing resources and support for essential maintenance of legacy systems with new development initiatives.

To support the CIO in carrying out these responsibilities, the agency's Information Resources Division was placed under the direction of the CIO in February 1996. Under the CIO's direction, the agency accomplished the following in FY1996:

- Chartered an Information Technology Workgroup (ITW), consisting of appointed representatives from each of the agency's major offices. The ITW was formed to better coordinate and integrate institutional and programmatic IT requirements, and recommend IT policies, standards, practices, and procedures. The ITW also identifies IT projects and program initiatives, recommends priorities among projects, and suggests program improvements that apply information technologies.
- Established an Internet team and formalized an agency-wide Internet Group to further develop the TNRCC Internet presence. In June 1996, the Internet team established the agency's Intranet (T-Net) and Executive Information System using Intranet technologies.
- Recommended to change the agency's methodology for the design, development and maintenance of its information systems. After the new methodology was adopted by the TNRCC in April 1996, Texas Instruments' Composer, a full I-CASE tool set, was procured and implemented. This methodology enables a technology transfer to the professionals in the TNRCC program areas for their design and development of program rules, processes, and data presentation. The use of joint application development teams along with the capture of business models, automatic generation of computer programs, and interfaces to data have proven to be highly successful with this new methodology.

The agency is building a single repository for data and process models. This repository is available for wide electronic utilization by program, scientific, and engineering personnel within the agency, other state and federal agencies, and for providing information to the general public. Significant re-engineering projects in progress using this I-CASE methodology include the Federal Clean Air Act, Texas Environmental Monitoring System, Emissions Inventory System, Public Drinking Water System, and Office of Waste Management Database Consolidation Project. Other re-engineering initiatives are underway to encourage electronic reporting and consolidate reporting to and from the agency.

In May 1996, the CIO established two small new organizational units, a centralized IT Budgeting and Purchasing unit, and an Information Center unit. The first unit focuses on the consolidated purchasing and contracting of IT hardware, software, and services for the TNRCC. It enforces the IT architectural standards for IT procurements and consolidates the IT budgeting activities for the TNRCC. The second unit establishes the standards for personal computer hardware and related office software used in TNRCC operations. It provides computer hardware and software for peer group testing and recommendations in their standard-setting activities. This unit also provides a basis for employees to test drive anticipated technologies before making a purchasing decision of these technologies. This unit coordinates the reuse of personal computer equipment into other TNRCC operational areas that cannot afford replacements for out-dated technologies.

The agency's out-of-date hardware and software infrastructure continues to require high maintenance to provide basic levels of network support. Problems with the agency's hardware and software infrastructure continue to attract great attention, diverting network support staff from their primary responsibilities and increasing costs. Software and supporting network wiring, servers, and telecommunications upgrades will remain the highest priority for any infrastructure upgrade funding within the agency. Three years of directed resources will be required to replace the obsolete telecommunications technologies at the current rate of replacement. These infrastructure replacements should be accelerated to reduce the anticipated three-year lost productivity costs within the agency.

The TNRCC's multi-tiered client/server network supports agency operations in the six-building central campus and fifteen regional offices. Symmetric multiple processors and the first massively parallel processor were installed in December 1996. This technology is the starting point in providing sufficient computing capabilities to support the diverse needs of the agency.

The TNRCC will continue to widen the range of information technologies it uses. The CIO's team, the IR Division, and others will continue to consolidate data management, data modeling, and statistical analysis at an enterprise level. Increasing the velocity of electronic information flows will provide a new level of scientific and engineering services to the various TNRCC program professionals, other state and federal agencies, and the citizens of Texas. A business process review of the agency's records management practices is currently underway. The review will result in

recommendations for the appropriate methods and technologies to improve timely access to records.

The CIO is organizing an Information Technology Steering Committee consisting of the Executive Director, Deputy Executive Director, Chief Information Officer, Chief Financial Officer, and Deputy Directors, and chaired by the Deputy Executive Director. This IT Steering Committee will be responsible for establishing high-level policies and standards, approving IT plans, addressing related IT issues and initiatives, and reviewing IT capital investments across the TNRCC. In the interim, the CIO has addressed the duties of the IT Steering Committee informally using both small group meetings with each Deputy Director and related Division Directors, and the Deputy Directors' weekly forum.

Major Initiatives in Fiscal Year 1996

To address strategic issues in accomplishing the agency's mission and goals and to support the evolution of IT in Texas state government as envisioned by DIR, the TNRCC started the following major initiatives:

- A fully integrated computer-aided software engineering package, a Texas Instruments' product, Composer, was chosen and acquired. Use of Composer will enable technology and skills transfers to the agency program professionals for the design of data models, process models, presentation models, and the automatic error-free generation of the complete set of computer programs for an information system. This methodology is independent of database management system software and operating systems, which enables seamless upgrades to or the replacement of computer equipment and related software packages.

- Federal Clean Air Act Interim Program (Title V) is being fully designed and developed using Composer. An integral component of this major development is the participation of program personnel.

- Texas Environmental Monitoring System (TEMS) was prototyped using new air monitoring instrumentation, real time telecommunications from remote monitoring stations, modified monitoring and analysis software from Lockheed, and data modeling software for 2-D visualization of various gases within the monitored spaces. Although it used legacy techniques and resources, the prototype was very successful. The ozone monitoring data was made available during the summer of 1996 and was widely used by the general public on the TNRCC networks and Internet. A Composer-based system will be designed and developed in FY1997 to analyze data from 30 or more new monitoring stations in Texas.

- Public Drinking Water System is being re-engineered into a Composer-based system after a very successful prototype development in August 1996. This will be the first major system to utilize the new EPA standards for EDI transmissions of laboratory analysis of drinking water. Currently, the

TNRCC is receiving over 300,000 written reports from just one laboratory, which is cooperating with the TNRCC in the implementation of EDI reporting. EPA has also provided their Public Drinking Water system templates that were developed in Composer for our analysis and reuse into the new TNRCC system. The EPA public drinking water EDI standard is one of two EPA EDI standards that has received approval from the American National Standards Institute.

- Petroleum Storage Tanks System is being re-engineered into Composer-based system after a prototype development effort in August 1996. This prototype will facilitate the re-engineering of all the appropriate systems that support the Office of Waste Management (OWM). The early prototyping efforts indicated the ability to reuse data models, process models, and presentation models in several program areas. Systems in the OWM are being re-engineered at the same time to provide the support for numerous waste functions.

- An enterprise-wide repository for program data models, process models, presentation models of screens, reports, Internet pages, EDI, and all TNRCC data (normalized data with Composer edits to provide extensive quality assurance and quality control) is being created. This technique will establish enterprise-wide data that conforms to program standards and is available for statistical and data modeling, with electronic visualization of program trends and results over time.

- Implementation of Project Management was begun for all IT projects. A proposal will be made to executive management to expand this technique for all TNRCC projects, with agency project tracking available on the Executive Information System (EIS).

- An Integrated Client/Server Financial System (IFS) was selected, tested, and procured. Implementation of this Oracle Government Financial software will improve customer service and streamline agency operations. The IFS supports agency goals by providing, tracking, and managing financial information, and facilitating purchasing and budget development by the divisions.

- The TNRCC Enterprise Architectural Standards for IT were established.

- Infrastructure improvements, evaluation of hardware and software, establishment of new standards for personal computers, new standards for enterprise telecommunications, Asynchronous Transfer Mode (ATM), and fiber optic technologies occurred.

- Four career ladders for IT professionals (Systems Administrators, Data Base Administrators, Local and Wide Area Network Managers, and Systems Analysts) were designed and approved.

- An enterprise IT Budgeting and Contract Administration Unit was established.

- IT staff training in Composer and telecommunications for related skills, abilities, and knowledge was established.

The goals, objectives, strategies, and action items found in Section 4 provide the direction over the next five years for IT at the TNRCC. Because this is a five-year plan, funding for these goals, objectives, strategies, action items, and other initiatives beyond the current operating year has been projected but has not been appropriated. Therefore, accomplishment of these goals and objectives is based upon availability of funding priorities established by TNRCC management. The TNRCC LAR for FY1998-1999 contains a priority allocation table in which the strategy for Information Resources is identified and budgeted.

Additional IT opportunities for innovation, re-engineering, and rightsizing which will allow the TNRCC to provide even better services are described in Section 5. These lists of opportunities will continue to be developed on a semi-annual basis to reflect the impacts of new legislative initiatives at both the federal and state levels as well as executive initiatives within the TNRCC. Many of these opportunities require funding or staffing resources. When additional funding or resources become available, these opportunities can be addressed in a priority sequence based upon business needs and benefits to the TNRCC.

Supplemental information relating to the IT organization, policies, planning, and technical structure is provided in Section 6. A description of the agency's software development methodology may be found in Section 6.C. A detailed configuration of the networks at the central campus and regions at TNRCC is contained in Section 6.D. Section 6.F describes the TNRCC's interagency network participation, including many of the current and planned activities within the TNRCC involving federal and other state agencies. Section 6.G indicates the critical databases and major applications that are in current operation supporting the business activities of the TNRCC. Many of these databases and applications will be re-engineered over the next three years into fully integrated, Composer-based systems utilizing the TNRCC repository database standards.

In summary, this TNRCC Information Technology Strategic Plan for Fiscal Years 1997-2001 presents the current organizational and technical structures at the agency and the vision for the future of its information technology.

3. PLANNING FACTORS AND ASSUMPTIONS

A. Environment

Historically, state and federal statutes and associated funding have established requirements for environmental programs with few requirements for interaction with other environmental programs. Therefore, most of the agency's information resides in many independent, stand-alone information systems. Because these information systems were developed at different times to meet the needs of the individual offices and programs, different data standards, processing standards, and definitions exist. These inconsistencies make the electronic exchange of environmental information very difficult.

As our environmental programs evolved, the TNRCC saw the need for a more holistic and aggressive approach in managing these programs. Therefore, a multi-media, functional approach was initiated to increase sharing and accessing of data by the public, industry, other government entities, and offices within the TNRCC. "Multi-media" refers to the various environmental areas of air, water, and waste. This multi-media approach is now considered in the development of information systems for the various environmental media. This effort requires additional information technology resources to assess existing systems, consolidate databases, give businesses and facilities common identifiers and geographical locators, and meet other needs of integrated information systems.

B. Population Increase

According to the Texas Comptroller of Public Accounts, the state population will grow from 18.8 million people in 1995 to 20.4 million in 2001. The projected growth will present challenges to the TNRCC in protecting our natural resources and environment, and corresponding challenges to the supporting information systems. Anticipated increases in requests for information and services from the public, industry, environmental groups, and other organizations will require increased information technology resources and advancements in technology.

C. Legislation

Federal and state legislative and judicial actions greatly impact the agency and supporting information systems, computers, networks, and professional staff resources. In some cases, the agency will be responding to recent statutes or judicial decisions. In other cases, actions taken several years ago will continue to challenge the TNRCC in the implementation and technological support of its programs. Increased legislated responsibilities will result in increased needs for funds for personnel, training, equipment, networks, and expanded technology.

A synopsis of the state and federal statutes, rules and court decisions which affect TNRCC are found in the TNRCC Strategic Plan for Fiscal Years 1997-2001. Examples of state legislative initiatives include the Inspection/Maintenance Program Revision, Permit Renewal Changes, Edwards Aquifer Water Quality Protection Program, Recycling, Petroleum Storage Tank Remediation, and Proposition 2 (pollution control). Examples of major federal legislative initiatives include the Federal Clean Air Act, Clean Water Act, Comprehensive Environmental Response, Compensation, Liability Act

(Superfund), Cost/Benefit Analysis (of all proposed federal regulations), the LaPaz Agreement between the U.S. and Mexico, and the North American Free Trade Agreement. These and many other legislative initiatives could alter the agency's direction or cause major program redefinition, which in turn could affect IT systems and resources.

D. Organization

The TNRCC has a legacy of programs and information systems designed and built independently of one another. Each has its own enabling legislation, rules, and legal history, its own set of industries and technologies that it regulates, and its own organization. Building the IT infrastructure to adequately support the operations of an organization as large and complex as the TNRCC has been one of the agency's greatest challenges. Complete reassessments of the agency's information management technologies and its needs for management information systems are among the basic responsibilities of the agency's Chief Information Officer.

The agency's management recognizes improvements are needed to reduce the redundant reporting requirements placed on regulated industries, expand electronic submittal and receipt of required information, and provide timely, accurate information for executive decision making. Decentralized data management in the past has resulted in numerous databases scattered on various computers throughout the agency. Because many of these databases and associated applications were not properly identified, standardized, or documented, the usability, security, and accessibility of the information they contain has been greatly limited. Improvements are being realized as the agency moves toward a multi-media, functional approach to data management.

The TNRCC's restructuring, consolidation, and streamlining of agency divisions, programs, and functions, including consolidation of regional staff into single offices within each region, affect the technical infrastructure, automated systems, data communications, and therefore, work of the IT staff. Work groups and technical program areas throughout the agency are actively reviewing processes to identify opportunities for functional restructuring. In instances where it is logical from customer service, business, and financial perspectives, some of these functions may be transferred to the regional offices. This decentralization of functions will place additional demands on the agency's IT infrastructure. The current and planned IT infrastructure improvements will ensure those demands are met.

Under the CIO, the Information Resources Division was reorganized along functional lines, rather than along business lines, to better support the multi-media approach and provide a single point of contact for automation-related questions and issues.

E. Technology

The TNRCC makes extensive use of technology for efficiency in its internal operations, particularly in relation to information management and communications. Throughout the next several years, rapid technological and scientific advancements will contribute to improve agency operations and customer service. These advancements will require changes in the supporting technical infrastructure for

systems, telecommunications, computing power, and security. Corresponding standards, policies, and required professional skills will be reassessed and revised as technology changes. Training programs for agency professionals to learn new technologies will be continuously improved and revised.

F. Funding

The TNRCC has a very complex funding structure. The agency manages 140 different fees, four separate budgets, 23 state funds, and federal funds and grants for 60 major organizational units. The most significant long-term trend in the funding structure has been the decline in general revenue funds and the growth in fee funds. The decrease mostly affects water programs as they are mainly funded by general revenue. Federal cutbacks at the Environmental Protection Agency (EPA) will shift responsibilities and costs to the state, requiring changes in program objectives and related automated systems, technical infrastructure, and alignment of professional staff. A new integrated client/server financial system will improve the management and provision of financial information.

Since some funds are based on the volume of waste generated or air contaminants emitted by industry, the agency's funding could shrink as the agency achieves its objectives of a cleaner environment. However, work loads and needs for technological advances are not likely to decrease in proportion to reductions in pollution. Changes may affect one program more than another, and therefore, resources needed for technological advances may not match the availability of funding for some programs. Formal project planning with full cost accounting will enable the TNRCC to better invest and project the funds spent on technology and determine the benefits received.

G. Customer Expectations

The regulated, environmental, and special interest communities are addressing information management and technology concerns. To provide better service, the TNRCC is integrating environmental information from different programs by linking among existing data systems or by actually combining them. The TNRCC is emphasizing the ease of access to information for agency personnel, other agencies, industry, and the public.

As the cost of dealing with environmental regulations grows, so does the attention of the regulated and environmental communities. Environmental issues are a major component of business strategy involving leaders and highly skilled professionals. Our policies and practices will be more closely examined, and if they are ineffective, they will be appropriate targets for change. The demand for access to raw data for both educational and research use will increase. Business leaders are becoming increasingly insistent that we manage information efficiently and improve administrative effectiveness. They want to:

- eliminate duplicate reporting,
- submit data electronically,
- limit additional reporting requirements in new rulemaking and statute implementation,
- shorten the response time for requests, and

- easily access valid multi-media information.

H. Federal Influences

The EPA has oversight of environmental programs and initiatives in Texas, and establishes requirements, outcomes, and deadlines for many TNRCC programs. Thus, the EPA directly influences the TNRCC through regulations, reporting requirements, delegation of authority, and funding. The EPA has promoted a more holistic multi-media approach to regulation. The TNRCC participates in the EPA's Common Sense Initiative to improve information systems, and redefine and consolidate reporting processes. The TNRCC also participates in the EPA's Facility Identification Initiative.

EPA has sponsored trials of ANSI-Standard Electronic Data Interchange (EDI) technology for regulatory transactions such as hazardous waste manifests, and participates in national standard-setting bodies defining new transaction sets. Since companies within certain industries have also adopted EDI technology for commercial transactions, we can expect to use EDI to mediate the exchange of quality environmental and regulatory data between otherwise incompatible computer systems. Using these standardized techniques will facilitate compatibility with changing EPA reporting requirements as well as with other external customers.

I. Self Evaluation

The TNRCC has had difficulty in recruiting and retaining experienced, highly qualified technical staff because of the salary structure, lack of IT professionals with required skills in the marketplace, and competition with the private sector for IT professionals. Adjustments to the staffing pattern and establishment of career ladders in four IT professional areas (while the agency salary budget remains constant) are expected to help in recruitment and retention of IT professionals. The career ladders will be supported with a focus on training and specific skills building.

The IR Division has begun to address many weaknesses in the agency's technical infrastructure which supports information service delivery. Remedies for these weaknesses are addressed in various sections of this IT Strategic Plan, and specifically under the IT Goals, Objectives, Strategies, and Action Items. With this new strategic direction, IT staff are experiencing the start of a major turnaround in FY1997. Historical shortcomings are being addressed by capacity planning, change management, process improvement, new services, and an agency perspective on technology investment. We fully expect that our services to our internal and external customers and our reputation in the technical community will be improved by the new strategic technical directions.

The CIO's team and Information Resources Division continue to communicate more effectively within the TNRCC, federal and other state agencies, and the regulated community. Staff actively participate in programs sponsored by our internal and external customers.

J. Summary

Our ability to use computers to communicate and share information within the agency, the public, and the regulated community will undergo historic changes in the next few years. We have the opportunity to carry out our mission much more effectively, and the public will expect us to do so. Customers will expect our information to be well organized, accurate, and easily available across media as well as from each specific program. They will have impressive examples of easy access to large amounts of information, and of the integration of information from a number of sources, and they will expect the same from us. They will grow accustomed to easy, secure electronic communication of high-quality documents and data.

Our information systems will enable the agency professional staff to perform their duties and responsibilities in dramatically better ways. Using these systems, these professionals will be able to provide accurate and timely information and improve services both within and outside the agency. To implement such systems, the agency's professionals must embrace rapidly changing technologies and methodologies. To facilitate this implementation, these professionals will be provided relevant training opportunities.

4. GOALS, OBJECTIVES, STRATEGIES AND ACTION ITEMS

The TNRCC information technology goals, objectives, strategies, and action items are provided in this section of the IT Strategic Plan. Each of the IT goals supports the:

- TNRCC goals and objectives (shown in Appendix A),
- one or more of the goals in the Department of Information Resources State Strategic Plan for Information Resources Management (shown in Appendix E),
- TNRCC Biennial Operating Plan for Information Resources containing the schedules for the baseline, growth and expansion, and over threshold projects: Integrated Client/Server Financial System, Federal Clean Air Act Information Management System (Title V), and Texas Environmental Monitoring System, and
- IT capital projects in the TNRCC Request for Legislative Appropriations for FY1998-1999.

The TNRCC information technology goals are broad in their scope and provide the basic direction needed for the agency, thus they are not individually mapped to agency and state goals.

IT Goal #1 Improve the TNRCC IT Infrastructure.

IT Objective #1 Replace 30 percent of obsolete IT infrastructure each year.

IT Strategy #1 Replace obsolete telecommunications wiring, bridges, gateways, PC cards, modems, routers, and other inappropriate telecommunications hardware and related software which do not support timely transmission of data and images.

Action Item #1 Implement procedures to measure the baseline performance and effectiveness of the current local area network (LAN) configuration. Routine measurements will be taken and compared to the baseline figures to project future needs.

Action Item #2 Implement procedures to measure the baseline performance and effectiveness of the current wide area network (WAN) configuration and services.

Action Item #3 Continue the expansion of an Asynchronous Transfer Mode (ATM) network switching capability to replace the present token ring environment.

Action Item #4 Upgrade the cabling in buildings C, D, and E on the Park 35 campus to Electronics Industry Association (EIA) Category 5 unshielded twisted pair cable.

Action Item #5 Install super servers in the Park 35 campus to consolidate the 75-80 Novell servers currently in operation and install the excess Novell servers in the regional

offices to replace their outdated equipment.

Action Item #6 Establish a charge-back system and service delivery standards to enable the agency to receive reasonable benefits for the costs incurred for IT services and more equitably allocate those costs to the customers.

Action Item #7 Replace obsolete and nonstandard workstations, personal computers, and related software.

Action Item #8 Establish and enforce common standards within the TNRCC for all acquisitions of IT hardware and software.

IT Strategy #2 Ensure the UNIX-based systems meet present and future agency requirements.

Action Item #9 Implement capacity planning to forecast anticipated growth patterns in UNIX hardware requirements.

Action Item #10 Upgrade or replace outdated and undersized UNIX workstations and servers in the Park 35 campus and in the regional offices.

Action Item #11 Install and implement a single state-of-the-art, automatic/robotic system for backing up all data servers in the Park 35 campus.

Action Item #12 Install and implement a Massively Parallel Processor (MPP) for use by all program areas using Oracle database applications.

Action Item #13 Install and implement state-of-the-art Symmetric Multi Processor (SMP) computers to support FCAA Title V and all other Composer projects.

Action Item #14 Continue to improve UNIX security, including the Internet Firewall.

Action Item #15 Procure and install new Internet/Intranet equipment that will meet all security requirements and support current and future needs of the TNRCC and the general public.

Action Item #16 Complete the rehost of remaining applications and data, including the Point Source Data Base, from the Unisys A-series mainframe to a UNIX server.

IT Objective #2 Establish a new information technology security program to bring the TNRCC into compliance with the Texas Administrative Code (TAC 201.13(b)).

IT Strategy #3 Develop and revise security policies and procedures to meet state requirements.

Action Item #17 Establish and refine an approved information technology security policy and procedure manual.

IT Strategy #4 Train employees so they can competently carry out their security responsibilities.

Action Item #18 Develop and implement a training program for the TNRCC information technology professionals to ensure the knowledge, skills, and abilities necessary to provide competent security administration.

Action Item #19 Develop and implement a training program for employees, whose functions depend on electronically stored and transmitted information, which ensures the availability of the knowledge, skills and abilities necessary to assess risk and specify protection requirements.

Action Item #20 Develop and implement a training program for the users of electronic information systems.

IT Strategy #5 Identify critical information and security processes, specifying ownership, classification, and risk.

Action Item #21 Conduct workshops with employees to identify critical and sensitive information and corresponding owners.

Action Item #22 Work with information owners to maintain a current risk assessment document.

IT Strategy #6 Establish Business Process Resumption Planning and Testing Plan.

Action Item #23 Develop and maintain a disaster recovery plan.

Action Item #24 Test the disaster recovery plan.

IT Strategy #7 Build and maintain a management and technical infrastructure that supports secure information systems.

Action Item #25 Define and implement roles and responsibilities for the management of secure information systems.

Action Item #26 Define knowledge, skills and abilities required for management of secure information systems.

Action Item #27 Develop and implement the planning for secure information systems.

IT Strategy #8 Develop metrics and measure security performance.

Action Item #28 Define management and technical measures of security compliance of and performance for each of the above strategies.

Action Item #29 Measure performance and publish results.

IT Objective #3 Resolve the Year 2000 date problem by the end of 1999.

IT Strategy #9 Establish procedures to enforce compliance with date standards and to test all IT resources to ensure correct operation.

Action Item #30 Find and replace outdated software code in embedded systems by the end of 1999.

Action Item #31 Represent year as four digits in all electronic files and related processes for agency activities.

IT Objective #4 Provide reliable, timely access to the agency's records.

IT Strategy #10 Improve the availability and retrieval of the agency's records.

Action Item #32 Review the document flow of the agency's business processes.

Action Item #33 Implement the recommendations, where feasible, of the business process review.

Action Item #34 Resolve and improve any inefficient and inconsistent processes that would inhibit access to the agency's records.

IT Goal #2 Facilitate the alignment of IT goals with the TNRCC, state, and federal goals.

IT Objective #5 Increase business program area and executive management involvement in IT planning and decision-making processes.

IT Strategy #11 Improve the effectiveness of the Information Technology Workgroup.

Action Item #35 Transform the Information Technology Workgroup from a coordination group to a joint planning and recommendation making group in FY1997.

Action Item #36 Create a project identification and prioritization process in FY1997.

Action Item #37 Ensure the Information Technology Workgroup members are empowered to speak for and can commit their respective areas to decisions made by the workgroup in FY1997.

IT Strategy #12 Establish the Information Technology Steering Committee.

Action Item #38 Establish a process to ensure agency-wide information systems budgeting and planning meet the agency's business needs in FY1997.

Action Item #39 Establish a process for large IT project prioritization and approval.

IT Objective #6 Expand Information Engineering methodologies into TNRCC programs.

IT Strategy #13 Recruit or train IT staff in Information Engineering.

Action Item #40 Identify training programs for agency professionals which ensure they acquire the knowledge, skills, and abilities necessary for Information Engineering methodologies.

Action Item #41 Budget for Information Engineering training.

IT Strategy #14 Develop all new applicable systems and replace existing legacy applications with ones developed using the TNRCC's Information Engineering Integrated Computer-Aided Software Engineering (I-CASE) tool, Composer.

Action Item #42 Obtain reusable Composer system templates from industry, other states, and the federal government when available.

Action Item #43 Build a central repository of reusable applications code, data and process models. By FY1998, model 20 percent of the agency's data and processes with Composer. In FY1999, this should be 40 percent; in FY2000, 60 percent; and in FY2001, 80 percent.

Action Item #44 Ensure 20 percent of the agency's data are in systems developed with Composer by FY1998. In FY1999, this should be 40 percent; in FY2000, 60 percent; and in FY2001, 80 percent.

Action Item #45 Ensure 40 percent of each Composer system developed will reuse elements from the central repository by FY1998.

Action Item #46 Reduce system maintenance by an average factor 5 to 1 over legacy systems by FY1998. In FY1999, this should be 10 to 1; in FY2000, 12 to 1; and in FY2001, 15 to 1.

Action Item #47 Ensure appropriate interim support is provided for critical or mandated legacy systems scheduled for Composer development.

Action Item #48 Ensure appropriate support is provided for critical or mandated existing systems that are not viable for Composer development.

IT Goal #3 Provide integrated and electronically accessible data.

IT Objective #7 Ensure all IT development projects include both electronic reporting and public access to data as appropriate.

IT Strategy #15 Participate in state and national groups establishing EDI standards.

Action Item #49 Form partnerships with public and private groups and other state and federal agencies to develop and demonstrate innovations in environmental reporting.

Action Item #50 Establish standard protocols to improve data and information flows in FY1997 and FY1998.

Action Item #51 Install a new integrated financial system in FY1997 and FY1998 which accommodates electronic approval of requisitions. In future fiscal years, work within state and federal standards to extend the electronic communications to bidders and vendors involved in purchases.

Action Item #52 Implement EDI reporting for Water lab samples as part of the Drinking Water Composer effort in FY1997 and FY1998.

IT Strategy #16 Expand electronic reporting with an emphasis on achieving universal access to electronic reporting by the regulated community.

Action Item #53 Accept 20 percent of enterprise reporting via EDI in FY1998. In FY1999, this will increase to 50 percent; in FY2000 to 80 percent; and in FY2001, 90 percent of enterprise reporting will be via EDI.

Action Item #54 Use Internet, starting in FY1997, so that each development project may include a deliverable to provide TNRCC environmental data to other regulators, industry, academia, environmental organizations, and the general public to promote protection of human health and environmental quality.

Action Item #55 Consolidate data into an enterprise-wide repository for greater reliability, accessibility, and visualization.

Action Item #56 Consolidate reporting requirements using information technologies to streamline the flow of data and to make data accessible electronically.

Action Item #57 Establish a statistical reporting group in FY1997. In FY1998, this group will establish a basis for evaluating the performance of environmental reporting and data management policies and programs and for designing improvements.

Action Item #58 Expand network connections to local and county governments starting in FY1999. In FY2000, schools and businesses will be added.

Action Item #59 Improve processing of near-real-time air monitoring data through update of TNRCC databases via the first deliverables of the TEMS project in FY1997.

Action Item #60 Introduce real-time water monitoring initiatives in FY2000.

IT Strategy #17 Provide employees, government agencies, and the general public access to timely, accurate, and appropriate electronic data.

Action Item #61 Initiate a project in FY1998 to link environmental performance data to other measures and spatial information for visualization of regional and community performance, including health, economic progress, and education.

Action Item #62 Provide access to the TNRCC Intranet (T-Net) to all employees and develop a plan for population of information on the T-Net in FY1997. The plan will be updated and additional information added annually as priorities and resources permit.

Action Item #63 Initiate a project to expand mobile computing in FY1998.

Action Item #64 Conduct a pilot project for telecommuting in FY1998. Future steps will depend on results of pilot and funding.

Action Item #65 Support planned regionalization of staff within the agency through automation investments in FY1997-2001.

Action Item #66 Expand air monitoring functionality from the TEMS project to other states in Mexico and the U.S. during FY2000-2001.

5. ADDITIONAL INFORMATION TECHNOLOGY OPPORTUNITIES

This section contains additional IT opportunities for innovation, re-engineering, and rightsizing which will allow the TNRCC to provide even better services. Many of these opportunities require funding or staffing resources. When additional funding or resources become available, these opportunities can be addressed in a priority sequence based upon business needs and benefits to the TNRCC.

Innovation

Initiate automated self-reporting for data submission through the agency's WWW site. Report generation should also be included so that agency customers (internal and external) are able to access the information they need with minimal assistance from the data custodians.
Benefits: More flexibility, better accessibility, and a quicker turnaround for customers needing agency data. Fewer staff will be needed to generate reports, freeing up staff to provide improved features into the databases thereby improving the overall quality of the data.

Cooperate with other agencies in establishing kiosks in public buildings statewide to help customers obtain information about regulated facilities, permitting processes, and other information. The kiosks could build upon Web services as well as connect to online systems.
Benefits: Increase public awareness and improve relationships with the TNRCC.

Change the current tabular view of data to a geographic view by developing a spatial and visualization component to all new applications. The component could serve as a user interface to program area data or as a decision making tool.
Benefits: Improve efficiencies and provide better tools.

Identify core field data that must be collected for every site visited. Provide regional office personnel with a data logger that can record and display site information.
Benefits: Improve efficiencies.

Develop a TNRCC Environmental Map of the State and include it in a TNRCC maps and accessories catalog accessible through the Internet.
Benefits: Increase public awareness and improve relationships with the TNRCC.

Provide spatial data, free software, environmental models, guidance, and school aids to schools who want to establish or expand environmental awareness programs for their areas.
Benefits: Increase public awareness and improve relationships with the TNRCC.

Determine appropriate technologies to automate access to records.

Benefits: Improve the accessibility and availability of the agency's records. Automated processes will also improve workflow and reduce the cost of accessing the agency's records.

Implement software to support the recommendations of the ongoing Business Process Review in the Human Resources and Staff Development Division. Recommendations may range from modifications to the current system to replacement and added functionality.
Benefits: Better serve current and potential employees of the TNRCC and ensure continued compliance with federal and state regulations concerning recruiting and personnel.

Re-engineering

Replace copy machines with high speed network printer/scanner equipment having collators and staplers to streamline printing, and place in strategic locations throughout the TNRCC.
Benefits: Eliminate copy machine leasing/maintenance contracts and reduce supply costs (toner, drum reconditioning, etc.).

Consolidate IT management functions in the TNRCC to incorporate network management (PCS and UNIX), asset management, help desk activities, software and hardware maintenance records and activities, automated software installations, purchasing/receiving/inventory activities, financial information, data backup and recovery activities, and troubleshooting activities into one organization regardless of geographical location.
Benefits: Eliminate duplicate management software with their costly yearly maintenance contracts, reduce staff support costs, improve customer service, reduce system downtime, improve asset management, and improve access to agency data for customers.

Actively participate in EPA's Facility Identification Initiative to establish a facility registry so state and federal agencies use the same ID schema for facilities. Incorporate facility ID into the permitting process and other systems. Establish a conversion implementation plan.
Benefits: Improve coordination and tracking of facilities and sharing of information.

Rightsizing

Explore telecommuting.
Benefits: Improve productivity; reduce traffic congestion and pollution; reduce staff turnover thereby reducing training costs and hiring activities; and reduce stress for employees who work from their homes.

Implement IT small projects teams comprised of technical and subject matter experts to evaluate the need for requested projects, identify the resources needed to accomplish the projects, and then implement formalized project management for approved projects. The IT small projects teams' functions may change depending upon the size of projects considered by the IT Workgroup.

Benefits: Ensure that projects having the most impact are appropriately prioritized and given adequate resources to meet the requirements and delivery dates.

Implement Service Level Agreements with customers.
Benefits: Improve customer satisfaction by ensuring that customer expectations are identified and agreed upon by all parties and that adequate resources are available to meet their expectations.

Implement teleconferencing, both PC to PC and conference room to conference room, etc.
Benefits: Reduce travel costs for remote offices; facilitate effective communications between remote sites, telecommuters, and mobile commuters; provide better time management and information sharing by providing online collaborative tools; provide training to larger numbers of people thereby stretching training funds.

Consolidate statistical and environmental modeling into one new group for the whole agency. The new group would provide standardized analysis of data across program areas; assist in the development of models for monitoring and decision making; and, train and educate staff in the use of new technologies for analysis and visualization.
Benefits: Establish consistent standards for analysis and decision making across the agency.

Consolidate authority and responsibility for Geographic Information System (GIS) and Global Positioning System (GPS) technologies into one new group for the whole agency.
Benefits: Realize economies of scale in use of equipment; more efficient use of agency resources; better direction and focus in applying technologies to business processes.

Consolidate all voice, data, and imaging telecommunications groups into one agency telecommunications group within the IR Division.
Benefits: Improve coordination of telecommunication technologies and implementation of currently available telecommunication standards statewide.

6. SUPPLEMENTAL INFORMATION

A. ORGANIZATION AND PERSONNEL

The TNRCC is currently organized into executive Offices for the Commissioners and the Executive Director, and seven Offices for Policy and Regulatory Development, Compliance and Enforcement, Administrative Services, Legal Services, Waste Management, Water Resource Management, and Air Quality. All Offices, except for the Commissioners and the Executive Director, are managed by a Deputy Director. The Chief Information Officer's team and the Information Resources Division are within the Office of Administrative Services. Organization charts for the TNRCC and Information Resources Division are provided in Appendix B.

The CIO's team includes an executive assistant, the Information Technology Team, and the Information Resources Division. The Information Technology Team coordinates Internet development and facilitates electronic reporting for the enterprise. The Information Resources Division has a Division Director, an administrative support group, and five sections which are organized to provide enterprise information technology services. The Information Center Section provides help desk support, desktop software support, and customer reporting services. The Project and Data Management Section provides the project management services, strategic planning, risk management, fulfillment of state planning and reporting requirements, geographic information systems (GIS) development, data administration support and development coordination services. The Records Management Section provides agency-wide records management and document imaging services. The Application Development Section provides software development and maintenance support for production information systems. The Systems Management Services Section provides enterprise data network support, local and wide area network support, data center services and operating systems support.

The primary responsibilities of Information Resources Division are to provide systems management support for all agency computer platforms, develop and support application systems to meet internal and external customer needs, design information databases that promote agency-wide data integration, develop and maintain agency software and hardware standards, manage the implementation and maintenance of Internet and bulletin board services, and provide records management for the agency. In addition to the staff in the Information Resources Division, the TNRCC has IT staff distributed to each of the offices, primarily to provide programming, systems analysis, and technical support for the local area networks and computer systems.

To provide support to meet the agency's automation needs, the Information Resources Division requires personnel with skills in integrated computer-assisted software engineering (I-CASE) methodologies, systems analysis and programming, computer operations, microcomputer support, network administration, database administration, Internet services, bulletin board services, electronic

mail, desktop technical support, records management, and clerical support. Because of the continuing development of applications and continued migration from the legacy systems to a client/server environment using the Information Engineering methodology and I-CASE tools, additional training is required. Training will be provided for areas such as I-CASE methodologies and tools, formal project management, databases such as Ingres and Oracle, UNIX administration for a client-server systems and open systems environment, ad hoc reporting tools, GIS software, and miscellaneous PC development tools.

B. POLICIES AND PRACTICES

Management

Priorities for major projects will be recommended by the Information Technology Workgroup and will be set by the IT Steering Committee working with the CIO. Through representation in these groups, the TNRCC offices are also provided the opportunity to communicate their IT development priorities, resource requirements, and issues.

The TNRCC has a very active GIS program in the Information Resources Division, and special-purpose GIS developments in several program areas. The GIS section is developing the TNRCC plan for spatial data acquisition and storage, coordinating and supporting the GIS efforts of the various program areas related to data capture and the integration of spatial and attribute data, and assisting in developing applications based on visualization, analytical modeling, or geomatics. This section represents the TNRCC on both state and federal committees related to GIS efforts.

The TNRCC information protection program was initiated in 1993 and produced a comprehensive risk analysis in 1994 and a disaster recovery plan in 1996. However, the protective measures recommended by these plans have not been implemented. The new information protection officer is currently planning a comprehensive, integrated information protection program incorporating best industry practices and meeting the requirements of 1 TAC 201.13(b) Information Security Standards.

Career ladders have been established in four IT professional areas throughout the TNRCC. Career ladder policy calls for hiring at the entry level followed by training and specific skill building to provide professional IT services to support agency programs.

The TNRCC will develop a Network Control Center, an Executive Information System, and a Statistical Analysis Center, and will implement full cost accounting, capacity planning, and change management.

Technology

The TNRCC Information Technology Architecture is published on the TNRCC's internal network. This architecture follows guidance provided by the Department of Information Resources (DIR) through their Architecture Framework for Information Resources Management (AFIRM).

The Application Architecture specifies use of the Information Engineering methodology, which includes Joint Application Design (JAD) and Integrated Computer-Aided Software Engineering

(I-CASE). Information Engineering methodology requires formal project management for all projects.

This methodology requires applications to have specific attributes such as providing metrics to the agency statistical database and Year 2000 certification.

The Data Architecture includes requirements for data modeling and database management systems.

In the Technical Architecture, the Standards Profile includes standards for a number of the service areas from the Technical Reference Model in the AFIRM, including UNIX APIs, communications protocols, and operating systems. The agency is converting to UNIX 95 standards for major application and data servers and Windows 95 for desktops.

Software development in the Information Engineering methodology requires development of an integrated agency business model using the I-CASE tool. Training agency staff in this effort will provide support of the model and reduce the dependence on consultants or contract services to implement software systems. The agency will still use consultants to quickly apply new technologies, such as I-CASE or automatic data acquisition, but will transfer the technology in-house in the course of the project. Communications with industry, other states, and the federal government to exchange reusable Composer system components will help the agency to leverage resources.

The TNRCC actively promotes electronic data interchange with the regulated community using both special-purpose programs provided by the agency or by cooperative arrangements with industry, and ANSI X.12 standard EDI formats. The agency has participated in EPA-sponsored pilot projects using X.12 transaction sets for waste management, and is currently evaluating proposals to use the World Wide Web for electronic data interchange with the regulated community and the public.

The TNRCC has limited projects underway in imaging and document processing. Simulation, numerical modeling, and scientific visualization are well established in air quality modeling and will be applied to other areas. There is a successful implementation of remote training for Internet usage using the Internet itself, and planning has begun for other distance learning initiatives.

During the past year, the TNRCC interactive Internet presence has been established with 1,600 Web pages that provide the public with accurate and up-to-date information on the agency's activities. Internet e-mail from the public to both agency subject matter specialists and organizational groups facilitates rapid response to inquiries for agency information. The T-Net is an internal online service communicating agency information and processes to all TNRCC employees including mobile and telecommuting sites using World Wide Web (WWW) technology.

C. METHODOLOGY FOR INFORMATION TECHNOLOGY PLANNING

Methodology Used to Develop and Implement the TNRCC Information Technology Strategic Plan

The TNRCC Information Technology (IT) Strategic Plan directly supports the TNRCC Strategic Plan; therefore, the process to develop the IT Strategic Plan begins with the development of the TNRCC Strategic Plan. During the agency planning process, the current strategic planning and budget structure underwent major restructuring. The goals and strategies in the TNRCC Strategic Plan were revised to reflect a functional approach, rather than a media-specific approach, for the major activities the agency undertakes to fulfill its mission.

In addition to revamping its goals, objectives, and strategies, the agency reduced the number of nonessential outcome and output measures being reported and reoriented the remaining measures toward more meaningful outcomes and outputs. These measures provide indications of the agency's performance in protecting and improving environmental quality.

After the agency developed a proposal for the revamped goals, objectives, strategies, and measures, agency staff reviewed the proposals with various outside stakeholders in state government, industry, and the environmental community. The Commissioners then approved the revamped functional approach to defining the agency's goals and strategies and the proposed planning and appropriation structure. Each division was asked to conduct an assessment of the internal and external factors, including scientific and technological developments, that would affect the programs and strategies for which it was responsible. Further review and refinement was provided by the Commissioners, Executive Director, and representatives from the business and environmental communities at the agency's monthly regulatory forum. A draft of the TNRCC Strategic Plan was also made available on the TNRCC's WWW site. The Commissioners approved the completed strategic plan in June 1996.

The TNRCC executive management gave the Chief Information Officer (CIO) the authority and responsibility for developing a high-level approach to planning and managing information technology investments to support the Commissioners' mission, priorities, and the TNRCC Strategic Plan. During the agency planning process, the CIO worked directly with the agency executive management (Commissioners, Executive Director, Deputy Executive Director, Deputy Directors and Division Directors), managers in the IR Division, and the IT Strategic Planning Team (Strategic Planner, IT Architect, and Security Officer) to obtain information, develop, and implement the IT Strategic Plan. As with the TNRCC Strategic Plan, the IT Strategic Plan reflects a functional approach in determining the current and future roles of information technology at the agency. The IT Strategic Plan is required by statute by the DIR.

A Project Team comprised of the CIO, IR Division Director and other managers, and the IT Strategic Planning Team prepared the draft of the IT Strategic Plan. The Strategic Planner served as the Project Team Leader. The Project Team Leader prepared a Project Plan which included specific roles and responsibilities, deliverables, and timelines. The project was coordinated through the agency's Agency Communications Division. During the process, the draft of the IT Strategic Plan was reviewed by and changed to reflect comments from the CIO and staff, IR Division managers and staff, Agency Communications staff, communication coordinators in all TNRCC offices, the Information Technology Workgroup (comprised of IT coordinators from each of the TNRCC offices), staff in TNRCC Strategic Planning and Appropriations, Deputy Directors, Executive Director, Deputy Executive Director, and Commissioners. Approvals for the IT Strategic Plan came from the IR Division Director, CIO, Deputy Directors, Executive Director, Deputy Executive Director, and Commissioners represented by the Chairman.

As part of the planning process, each division developed a business plan and an operating budget for FY1997. The IR Division also developed and kept updated the agency Biennial Operating Plan, which reflects the agency Legislative Appropriations Request for information technology projects. The IR Business Plan for FY1997 provides high-level division objectives, assessment of strategy or program partnerships, division self assessment, key initiatives, resources requested to meet agency goals, and strategies with objectives, outcome measures, costs and FTEs. The IR Business Plan, Biennial Operating Plan, and operating budget support the IT Strategic Plan and the TNRCC Strategic Plan.

Information Systems Development Methodology

The TNRCC purchased an Integrated Computer-Aided Software Engineering (I-CASE) tool from Texas Instruments called Composer. Acquisition of the I-CASE tool, training for staff, and facilitation of JAD sessions were done through separate open market bid procurements. Composer was selected for the following features:

- Extend development methodologies to support faster development while maintaining rigor, standardization, and consistency across development projects.
- Ensure consistency and completeness within each toolset and across toolsets using built-in rules.
- Provide 100% generation of data, language, complex logic, communications and presentation application components from high-level, graphically rich specifications.
- Automatic consistency checking of attributes, data model elements, process elements, and business processes.
- Provide ability to build client and server applications for a variety of platforms, operating systems, databases, monitors, and languages.
- Provide technology independence to guard against environmental lock-in and to support portability and interoperability among multiple environments.
- Allow reuse of existing Composer-defined application components in new applications.
- Ability of JAD teams to work interactively from local and remote locations. Distance is not a problem, especially when contractor staff participate in JAD sessions.

- Allow multi-user and multi-team development environments.

Composer is a full development life cycle tool that uses an Information Engineering methodology. Composer's objective is to build a full life-cycle, model-driven, application development environment. Composer relies on both data and process modeling to build a business system model. This tool set and its accompanying manuals define a rigorous development process that should result in the implementation of a documented system that meets the business needs of the TNRCC.

The primary components of Composer includes five toolsets:

- Planning - supports the planning of projects, and scoping of projects and software components. It produces deliverables targeted to top-level managers.
- Analysis - supports the definition of a detailed business model. It produces deliverables expressed in end-user terms.
- Design - supports the definition of external and internal design. Produces External Design deliverables meaningful to trained data processing professionals.
- Construction - generates the entire application from the details defined using the Planning Analysis and Design toolsets. Produces deliverables that can be executed by computers.
- Implementation - supports interactive diagram testing, code and database installation, and program execution on target platforms.

In the real world, one development strategy does not fit all application development needs. The manual titled "Development Strategies Using Composer by IEF" provides an overall development strategy that is also called a "pattern life cycle" because it can be easily customized to meet specific development needs. This gives a project manager the choice of three different development strategies that can be used in different situations. These are Business Systems Implementation (BSI), Managed Development Risk (MDR), and Rapid Application Prototyping for Rapid Application Development (RAP/RAD). This manual provides the criteria for selecting the best development strategy for the situation. All three strategies are complete systems development processes and come with full "work breakdown structures" (WBS) which list the tasks for each phase, inputs, deliverables, effort, and roles required for each task. "Integral processes" such as quality assurance, inspections, documentation for system and customer use, and configuration management are included in the tasks. Training is being provided by the vendor in a just-in-time manner. Formal and on-the-job training will be ongoing for approximately the next six months to give our project managers, development leaders, and program area personnel (customers) the required knowledge and skills.

Information Engineering requires extensive customer involvement throughout the life cycle. Program area personnel are involved in Joint Applications Development (JAD) sessions. This technique improves the quality of and speeds up the requirements phase of systems development.
Since customers are so heavily involved, they must be trained on certain aspects of the tool.
Training classes given to date were composed of approximately a 50/50 split of IR and program area

personnel.

D. CONFIGURATION

The TNRCC's current configurations include Local Area Networks (LANs), client/server- based systems, and mainframe systems connected via a wide area network (WAN) throughout the Park 35 campus and the 15 regional offices. The following paragraphs summarize the various configurations used at the TNRCC.

The LAN systems are Novell file servers connected to approximately 3,100 IBM compatible personal computers (PCS) primarily via token ring and to Apple Macintosh computers via Ethernet or token ring. The major software used includes: Novell GroupWise for e-mail, WordPerfect, Paradox, Quattro Pro, dBase, FoxPro, Freelance, Norton Utilities, Mace Utilities, FProtect (virus scanning software), Legato (backup software), and Saber LAN Workstation (network menus).

The client/server systems are UNIX-based three-tier architecture which includes separate database and application servers from Pyramid, Siemens-Nixdorf (S-N), Hewlett Packard (HP), IBM, and Silicon Graphics. Some of the systems follow a two-tier architecture, in which database and application services are on the same platform, or applications services are split between the client and the database server. Clients are UNIX workstations or PCS using X-Windows or Windows server software and communicate using the TCP/IP protocol suite. Oracle is the agency standard database; however, other databases are used such as Impress, Informix, and Ingres with its fourth-generation software. The standard applications development environment is Texas Instruments Composer which is an Information Engineering I-CASE tool. Still in use are Fortran, C, and MicroFocus COBOL. Server applications include HP OpenView Optivity and Network Node Manager, BMC Patrol, Software Clearing House (SCH) Software Reel Backup, SCH Reel Librarian, SCH Scheduler, and HP OmniView.

Major applications include the TNRCC Regulatory Activities and Compliance System (TRACS), Prophecy (accounts receivable), OnTrack (training management), Time Keeping, Test Point Source Database (PSDBTST), USAS/EPA Report Generator, Group I (Postal Services Bulk Mail Software Management), and Vehicle Inspection and Maintenance. Internet services provided include Sendmail, FTP, News, and NCSA WEB. TRACS is used to support Waste and Water Program permitting, and enforcement and compliance activities. An Oracle Government Financials client/server integrated system was purchased and is being installed. GIS and mapping work is done using Environmental Systems Research (ESRI) ARC/INFO. Statistical work is performed using standard SAS software.

Two Unisys A6-series mainframe systems are connected to each other and to the communications processor via the Burroughs Network Architecture. Applications on these systems are being rehosted to the Pyramid Nile system into an Oracle database. The A6 system includes a disk subsystem, a tape subsystem, line printers, and a front-end communications system accessible via the agency network. The operating system is Master Control Program/Advanced System (MCP/AS) and Data

Management System II (DMSII) is the database management system. The database inquiry system is Extended Retrieval with Graphical Output (ERGO). Applications and databases were developed using Group 4. When the rehost project is completed in FY1997, the mainframe will be taken out of operation. At that time, the agency will not have a mainframe on its network. Other mainframes were retired in calendar year 1995.

E. TELECOMMUNICATIONS INFRASTRUCTURE

Data communications are accomplished primarily via token ring LANs with a few Ethernet segments. Synoptics hubs and Cisco routers and switches are the standard interconnectivity devices. We have installed some Asynchronous Transfer Mode (ATM) super switches and will be testing these in the next few months. Eventually, we will convert the entire local network to ATM switching. For wide area network services, we contract with Southwest Bell Telephone for Frame relay, T1, and 56 Kb links. Some Integrated Services Digital Network (ISDN) links exist in some of our regional offices. A communications gateway provides outside access to the Internet, and a Novell GroupWise Simple Mail Transfer Protocol (SMTP) gateway provides access to other e-mail systems via the Internet. An SNA gateway provides access to the State Comptroller of Public Accounts and to the EPA. The agency's network is monitored via a network management system built around HP's OpenView software. The TNRCC also operates a computer bulletin board system (BBS) called "TNRCC OnLine." Access to the BBS and Internet is available to agency staff and to outside entities, including state agencies, the regulated community, the environmental community, and the public. (See Appendix C for the Local Area Network Diagram and Appendix D for the Wide Area Network Diagram.)

Voice communications in the central office complex are provided by an on-site Northern Telecom DMS 100 digital switch operated by Southwestern Bell Telephone under a Custom Plexar centrex service contract which will expire on December 10, 1998. The switch is served by 140 local trunks and 72 TEX-AN trunks. All six buildings in the complex are connected to the switch via underground cable. The network consists of nearly 4,000 voice, modem, and fax stations. Voice mail services for over 2,200 voice mail boxes are provided by on-site Octel Voice Messaging System equipment installed and maintained by the General Services Commission. Eleven of the fifteen regional offices are served by digital key systems. The Beaumont office has a Custom Plexar centrex arrangement with Southwestern Bell. The Houston office shares a Private Branch Exchange (PBX) with several other state agency field offices in the Baker-Hughes State Office Building. The Corpus Christi office is on the campus of Texas A&M University at Corpus Christi and is served by the university's PBX. The Tyler office has its own PBX.

F. INTERAGENCY NETWORK PARTICIPATION

Numerous current and planned activities within TNRCC are providing, sharing, and exchanging data with EPA national (and other federal agencies), EPA Region 6, and other Texas state and local agencies. These activities include:

EPA Grants
Grant documents are exchanged on paper and via Internet e-mail, sometimes with attachments.

EPA Grant Pilot Project
Grant Processing information is exchanged via Lotus Notes.

Aerometric Information Retrieval System (AIRS)
Air emission (stationary and ambient) data is sent daily to EPA via FTP as required by the Code of Federal Regulation (CFR) 40. Site and monitor registration and ambient data is uploaded using Attachmate and updated to the EPA AIRS/AQS (Air Quality Subsystem) database on Mondays and Thursdays.

Monitoring Operations (MO)
MO is responsible for sampling and analyzing ambient air for various contaminants. MO provides the resulting monitoring data to EPA, industry, universities, and private organizations. The majority of the data is exchanged via FTP. MO receives monitoring data on diskettes from local programs which manage their own monitoring stations and provide TNRCC the data for EPA reporting purposes.

Industrial and Hazardous Waste Biennial Report
Solid Waste data from TRACS is reformatted in ASCII and sent via FTP every two years to EPA Region 6.

TNRCC GIS Data
The TNRCC shares GIS data via FTP with the General Land Office, Texas Parks and Wildlife Department (TPWD), Texas Water Development Board (TWDB), Texas Natural Resources Information System, Texas Department of Transportation (TXDOT), U.S. Bureau of Census, Texas Border (EPA), U.S. Geological Survey (USGS),U.S. Department of the Interior, Houston-Galveston Area Council, river authorities, and council of governments.

Railroad Commission (RRC) and General Land Office (GLO)
The TNRCC has agreements with the RRC and GLO to provide permitting research reports involving spills of oils and hazardous materials in the state. Sometimes the collection of spill information involves other state agencies. Information is sent by phone, fax, and paper.

Comptroller of Public Accounts (CPA)

The TNRCC Office of Administrative Services has online connections with the Uniform Statewide Accounting System (USAS), Uniform Statewide Payroll System (USPS), and State Property Accounting (SPA) to update financial, payroll, and property inventory data. Labor Distribution data is sent to the CPA. The CPA sends TNRCC accounts receivable data. A development effort is underway for the TNRCC to report data in the Oracle Government Financials client/server system to USAS.

Texas State Library

The TNRCC Library has an online connection with the Texas State Library to update publication data.

USGS Gauge Stations Information

Gauge Stations information is obtained from the USGS via the Internet to facilitate water allocation decisions. River flow data is obtained daily to satisfy a Watermaster mandate to allocate available water among water rights users (Section 11.327, Texas Water Code). Plans are to continue retrieving this data in this manner. No obstacles are anticipated at this time.

Legislative Information Agent (LIA)

The TNRCC retrieves legislative bill information from the Texas Legislature biennially during the January through June sessions. State bills formed during the Texas legislative sessions are reviewed by the TNRCC staff to determine how they impact the agency, how the TNRCC should respond, and what recommended actions should be taken. LIA is a licensed software used to retrieve, distribute, and process the bill information.

State Office of Administrative Hearings (SOAH)

The SOAH requests the TNRCC for Docket Numbers. The Docket System assigns numbers and tracks pending or Commissioners' Agenda items for permitting, enforcement, hearing, and $1 million contract activities. Future plans are to encompass activities from initial filing through completion.

Office of the Attorney General (AG)

The TNRCC and AG exchange pending and final legal information through the TNRCC e-mail system.

Certified Occupational License Holder List

The agency sends a complete list of certified occupational license holders from 27 permit categories to the AG on diskette. The data is resent each month for comparison with the AG's list of persons who fail to pay child support. Each year, the Guaranteed Student Loan Corporation sends TNRCC a tape of persons in default on their student loans for comparison with our list of persons requesting permit licenses. These instances of data sharing are the result of recent legislation.

Nonpoint Source Program Information

Within the Nonpoint Source Program, water information is exchanged with the EPA via e-mail and through Arbiter (software that allows the TNRCC to electronically upload information into the EPA's Grants Reporting and Tracking System). Information can also be transferred to a remote disk found on the EPA NCC mainframe.

Water Utility Mail Merge Information

"Mail merge" messages are exchanged over the Internet with the Texas Department of Housing and Community Affairs, Texas Department of Health, GLO, and the TWDB through the Small Towns Environment Program.

Under a proposed memorandum of understanding (MOU) between the TNRCC and the TWDB, TWDB would have access to the TNRCC Public Drinking Water System database, using either hard copy listings or file transfers, to support administration of the Drinking Water State Revolving Loan Fund. The TNRCC and the TWDB may also be interested in sharing colonias drinking water information through file transfers.

Self-Reported Data on Water Quality Permits

The Agriculture and Watershed Management Division provides self-reported data and permit data for water quality permits on microfiche monthly to the following agencies:

- Harris County Pollution Control
- City of Houston
- Houston Health Department
- North Central Texas Council of Governments
- Texas Department of Health
- EPA Region VI
- Trinity River Authority
- Sabine River Authority
- City of Dallas
- City of Corpus Christi.

An inventory of active water quality permits is sent to the Houston Health Department and the TWDB. A detail listing of all permit requirements is also sent to the TWDB.

Wastewater Permit Application Data from the Secretary of State

Every day, the staff of the Wastewater Permit Applications Team connects via modem to a database maintained by the Secretary of State to verify information regarding wastewater permit applicants, such as their addresses, legal status, authority to do business in Texas, and payment of taxes per Part Two, Texas Business Corp. Act, Art. 2.45, Delinquent Tax.

Surface Water Rights Data

The TNRCC maintains a database of surface water use permits and contracts for the use of surface water in the state. The database records are used by the TWDB and TPWD for planning information and for information on water rights in particular study areas or areas of concern.

Surface Water Quality Monitoring (SWQM) Data

The SWQM database contains information on the physical, chemical, and biological characteristics of water in streams, reservoirs and estuaries. Data collected by TNRCC regional personnel, river authorities, municipalities, health departments, and other entities are stored in the SWQM Database and used continuously in all areas in the Water Program. Data are submitted in specifically formatted electronic files by entities collecting water quality samples on diskettes.

SWQM data are available to other agencies, institutions, consultants, local governments, and the public in paper report formats as well as ASCII files formatted for loading into spreadsheets or databases. Recent data are also available as database-formatted files on the Internet through the Clean Rivers Program homepage.

The TNRCC also has a number of federal commitments that rely on the operation of the SWQM Database. Twice a year, as part of our cooperative agreement with EPA under Section 106 of the Clean Water Act, we must submit data to EPA Storage and Retrieval of U.S. Waterways Parametric Data (STORET), a national water quality database. EPA is expected to implement a new STORET database format in the future. Once a year, we are required to update the EPA Water Body System, an automated database of assessment results. Primary statutory authority for the SWQM Program is Section 26.127 of the Texas Water Code.

Ecosystem Research Data

We are connected by modem to the Department of Human Services, who stores one of our databases. We routinely share data and information with the TPWD Aquatic Studies Group in San Marcos, Texas. We share data and technical information with the University of Texas and Texas A&M University. We answer numerous data requests from cities, water supply corporations, and the consultant community.

Information Supporting Wastewater Permitting

State and federal biomonitoring requirements for wastewater permits, and the critical conditions used to develop numeric limits and biomonitoring requirements for state and federal wastewater permits, are exchanged with EPA monthly via Internet e-mail.

Texas Watch Data

Texas Watch has individual databases, containing names, addresses, and other information about individuals who are monitoring the watersheds in Texas. Information about citizens monitoring data is shared with River Authorities, the EPA, all partners of Texas Watch, any TNRCC entity that needs

this information, and any individual request from the Internet, phone, or hard copy.

Clean Rivers Program (CRP)

The following types of information are exchanged with contractors under the Clean Rivers Program:

- SWQM data by Internet and diskette twice a year.
- Wastewater Permit data by Internet and diskette twice a year.
- Petroleum Storage Tank (PST) data by Internet and diskette upon request.
- Industrial Hazardous Waste data by Internet and diskette upon request.
- Water Rights data by Internet and diskette upon request.
- Water Utilities data by Internet and diskette upon request.

Ground Water Nonpoint Source Data

Information is exchanged daily over the Internet with many agencies, academic institutions, and public interest groups. This includes TNRIS (Texas Natural Resources Information System), USGS (United States Geological Survey), EPA, the University of Texas Bureau of Economic Geology, TXDOT, and ground water conservation districts. Data is exchanged via tapes, compact disks (CDs), and electronically.

Regional Office Activity

The regional staff in waste, water, air, and other program areas access the Internet daily. Examples of information exchanged include environmental, procurement, and state and HUB contract data. Information is exchanged with the following:

- General Services Commission (GSC)
- Texas Department of Housing and Community Affairs (TDHCA)
- U.S. Information Agency (USIA - State Department)
- University of Texas at El Paso (UTEP)
- Border Environmental Cooperation Commission (BECC)
- TXDOT (Base Station Data for GPS)
- Texas State Agencies Round Table (multiple state agencies)
- Procuraduria Federal de Protección al Ambiente Delegación Estatal en Chihuahua (PROFEPA - Mexico's EPA)
- Secretaria de Comunicaciones y Transportes (SCT)
- Agencia de Aduanas (Mexican Customs)
- National Institute of Ecology (INE)
- Southwest Texas University
- New Mexico Environmental District
- EPA (MACT Standards for FCAA Title V and emission factors for sources).

The following are enterprise-wide known agency plans for increased sharing with other state agencies:

- Considerations are being made to electronically exchange tire recycling data with the Comptroller of Public Accounts for tracking and reconciliation. This will be an enhancement to the Tire Management System (TMS).
- Water Utilities Division plans to increase the exchange of larger, more complex data files over the Internet with the Texas Department of Housing and Community Affairs, Texas Department of Health, GLO and the TWDB through the Small Towns Environment Program. Data is currently exchanged over the Internet using various file management techniques.
- Meetings are underway to evaluate a Watershed Delineation Application under the Work Plan Integration Pilot Study (WIPS) using the Internet.

The following are Electronic Data Interchange (EDI) efforts under consideration with the EPA:

- A pilot Public Drinking Water application involving Coliform test results.
- A National Pollutant Discharge Elimination System (NPDES) EDI application within the Water Resource Management Office. Efforts beyond the discussion stage will continue after delegation discussions and approvals are complete.
- An Emissions Inventory application.
- An Air Title V Application.

The following are obstacles in the way of further sharing:

- No agreement for ensured privacy of industry proprietary data.
- No consensus on appropriate security levels and authentication procedures.
- Lack of adequate resources (staff and budgeted funds).
- Lack of common data identifiers.
- No common infrastructure (hardware, software, and database incompatibilities).
- No established lowest common denominator standard for hardware or software.
- Inadequate training on how to exchange data needed/required.

An extensive agency search of statutory changes that are required to facilitate sharing has not been made. The following are recommendations:

- Delegatory authority for selected media from the EPA.
- Removal of references to the use of paper for reporting, except where not feasible.
- Recognition of electronic signature technology as a replacement for the written signature.

An extensive agency search for needs of state cooperation to facilitate sharing has not been made. The following are recommendations:

- An agreement for ensured privacy of industry proprietary data.
- A consensus on appropriate security levels and authentication procedures.
- An agreement on common data identifiers.
- An agreement on a common infrastructure (hardware, software, and database compatibilities).
- An agreement on the lowest common denominator standard for hardware or software.

G. DATABASES AND MAJOR APPLICATIONS

Databases and Applications

Database:	TRACS
Software:	Ingres, C, Report Writer, Natural
Hardware:	IBM RISC 6000 970 Server IBM RISC 6000 530 Server IBM RISC 6000 340 8 IBM RISC 6000 320 Server IBM RISC 6000 220 12 HP-9000 Model 735 Servers Pyramid Nile 100 15 Siemens-Nixdorf RM400C, 2 S/N RM400
Location:	Park 35 Complex, 15 Regional Offices
Batch/Online Status:	Online update/inquiry, some batch updates/reports
Est. Physical Storage Req.:	22 Gb
Application Description:	Tracking of regulatory and compliance information for the core functions of the TNRCC. Functionality also includes billing and reporting.
GIS Data Classification:	Depends on applications
Sharing:	Depends on applications
Future Plans:	TRACS is scheduled to be replaced by the end of the 98/99 biennium with Composer/Oracle technology.

Application:	TRACS - Petroleum Storage Tank Registrations
Software:	Ingres Windows 4GL, Ingres Report Writer, C, Natural Language
Hardware:	See TRACS
Location:	Park 35 Complex, 15 Regional Offices
Batch/Online Status:	Online update/inquiry
Application Description:	Petroleum storage tank registration system. This includes tank, facility and owner transfers, fee assessments and billing. Also used to generate a unique number for the tracking of leaking petroleum storage tanks incidents (LPST).
Est. Physical Storage Req.:	Included in TRACS requirement above
GIS Data Classification:	Database tables designed to accept GIS data when it becomes available.

Sharing:	Read only access is also provided to Fiscal, Responsible Party Remediation, and Enforcement Sections as well as all 15 regional offices.
Future Plans:	See TRACS

Application:	TRACS - Industrial and Hazardous Waste Integrated Systems
Software:	Ingres Windows 4GL, C, Ingres Report Writer
Hardware:	See TRACS
Location:	Currently implemented at Park 35 campus and at regional locations.
Batch/Online Status:	Online inquiry and update. Summary reporting and some NOR updates applied via batch updates from data entry. Electronic upload of quality-checked data from STEERS.
Est. Physical Storage Req.:	See TRACS requirements above
Application Description:	Tracking information from several of the Industrial and Hazardous Waste & Evaluation processes. Data in TRACS-IHW is integrated. Listed below are some of the main functions of TRACS - IHW. 1. Registration of identification data on clients engaged in the generation, management, transportation, and disposal of industrial and hazardous waste. Data collected includes waste and facility groups who manage waste. 2. Referencing of identification data on maquiladoras engaged in the generation of industrial and hazardous waste. Data collected includes waste generated by the maquiladoras. 3. Tracking of identification data on one-time shippers who generate industrial and hazardous waste. 4. Tracking of reported generation and quantities for disposal activities involving industrial and hazardous waste. Summaries reported are monthly receipts (from receivers) and annual waste and waste shipments (from generators). 5. Tracking of audits done on class 2 and class 3 wastes for both registered and one-time shipper wastes. 6. Automation of waste generation fee exemption requests. 7. Annual billing program from summary report data for hazardous and nonhazardous generator fees and quantity information used to audit fee payments. 8. Reporting capability allows users to request most of their own reports with the choice of printing at a local printer or at the main Xerox printer. Reports include information from all functional areas noted above in descriptions 1 - 7. Also EPA Biennial Report to meet requirements for EPA grant money can be generated.

GIS Data Classification:	Has capability of lat/long in the location table for IHW registrations and maquiladoras. Lat/Long data is currently not complete.
Sharing:	Some IHW registration and summary report data is accessible to the general public and agency staff through batch reports provided by the IR Customer Reports & Services Team.
Future Plans:	See TRACS

Application:	TRACS - Wastewater Permitting Process and Surface Water Quality Monitoring
Software:	Ingres/Windows 4GL, Ingres/Report Writer, Natural Language, C, UNIX scripts and SQL
Hardware:	Client/Server - PC running X Window, Pyramid Nile 150
Location:	Information Resources, currently implemented statewide
Batch/Online Status:	Online update/inquiry, batch. Self-reporting are applied via batch files from data entry.
Est. Physical Storage Req.:	See TRACS requirements above
Application Description:	Listed below are some of the main functions of TRACS - WQ: 1. Registration of identification data on clients engaged in the wastewater permitting process. 2. Maintain water quality station and sampling information. 3. Tracking of all functions of stream monitoring required by the TNRCC. 4. Annual billing process. 5. Reporting capability allows customers to generate a variety of reports as they are needed.
GIS Data Classification:	Contains locations of stations which could be used in GIS
Sharing:	Some registration and summary report data is accessible to the general public and agency staff through batch reports. Also, data shared with River Authorities under SB818.
Future Plans:	See TRACS. The EPA plans to implement a new STORET database format in the same time frame that SWQM TRACS will be replaced by a Composer system, and compatibility of the databases and systems will be considered in the planning process.

Database/Application:	Stack Test Observation Tracking System (STOTS)
Software:	Ingres, Windows 4GL, Report Writer, ReportSmith, Exceed
Hardware:	IBM RISC 6000 970 Server IBM RISC 6000 530 Server IBM RISC 6000 340 8 IBM RISC 6000 320 Server

	IBM RISC 6000 220 12 HP-9000 Model 735 Servers Pyramid NILE N150 Pyramid MIServer - 12 ES Pyramid MIServer - 4 ES 15 Pyramid MIServer - 2 ES
Location:	Park 35 Complex, 15 Regional Offices
Batch/Online Status:	Online update/inquiry, some batch updates/reports
Est. Physical Storage Req.:	200 Mb + 10 percent annual growth.
Application Description:	System to assist the regional investigator while on-site during the stack investigation. The data will reside on a UNIX-based mini-computer at the central office, Field Operations Division, so management can manipulate and control the information. All regional Pyramids will have access to the data via a direct link across the Wide Area Network (WAN) to the central office in Austin.
GIS Data Classification:	None
Sharing:	15 Regional Offices have update ability.

Database/Application:	Interim Enforcement
Software:	Paradox 4.5
Hardware:	PC DOS
Location:	ENF Server
Batch/Online Status:	Online
Est. Physical Storage Req.:	30 Mb
Application Description:	Tracks activities associated with identification of the parties legally responsible for costs related to remediation activities. Information in this database consists of enforcement records extracted from several other databases.
GIS Data Classification:	This application does not contain information usable in a state-wide GIS.
Sharing:	Accessible from Saber Menu only. Data is not shared with other agencies.

Database/Application:	MSW Compliance and Enforcement System
Software:	FoxPro for Windows 2.6
Hardware:	PC/Windows
Location:	ENF and Regional Office Servers
Batch/Online Status:	Online inquiry, update and reporting
Est. Physical Storage Req.:	Current: 212 Mb on ENF, 12-14 on regional servers. MSW will grow by approximately 10 - 15 Mb per year, the regional copies will

	grow from 1/4 to 2 Mb per year.
Application Description:	System tracks all inspection data collected in the field and enforcement data collected in central office. The system generates inspection reports, compliance and violation letters, the MSW enforcement log, compliance histories, and miscellaneous reports.
GIS Data Classification:	None
Sharing:	Not shared outside the TNRCC

Database/Application:	Municipal Solid Waste System (MSW)
Software:	FoxPro for DOS 2.0
Hardware:	PC DOS
Location:	MSW Local Area Network
Batch/Online Status:	Online update/inquiry
Est. Physical Storage Req.:	19 Mb with expected growth of 2 Mb per year
Application Description:	This application is used for generating a quarterly billing for permitted MSW sites.
GIS Data Classification:	The permit application information for landfills does contain latitude and longitude and could be properly formatted for GIS purposes.
Sharing:	No data is given or transferred to other state agencies.
Future Plans:	None identified at this time.

Database/Application:	Tire Management System
Software:	Visual FoxPro 3.0 - GUI, Oracle backend database
Hardware:	Client/Server with Oracle database on Pyramid Nile 150 and Client PCS 486/66 or above
Location:	ENF Server (LAN)
Batch/Online Status:	Online update/inquiry
Est. Physical Storage Req.:	30 Mb
Application Description:	This application is used for: 1. Registration of companies involved with waster tires, i.e., waste tire generators, transporters, processors, and recyclers. 2. Storage of data from periodic reports from these companies, as required by TNRCC regulations, Subchapter R. 3. Auditing of the company reports and reconciliation between these reports. 4. Generation of correspondence to the companies. 5. Generation of periodic reports from the database.
GIS Data Classification:	None
Sharing:	Ability to share information with the Comptroller of Public Accounts.
Future Plans:	Pending possible future legislation.

Database/Application:	OnTrack for Training
Software:	Purchased package
Hardware:	Client/Server with Oracle database on Pyramid Nile 150 and Client PCS 486/66 or above
Location:	Admin/Information Resources
Batch/Online Status:	Batch, online update/inquiry
Est. Physical Storage Req.:	30 Mb
Application Description:	Maintains list of agency-offered courses and employees who receive training.
GIS Data Classification:	None
Sharing:	No
Future Plans:	Human Resources has funding to replace this software package with one that more closely meets their business needs. Analysis and purchase will take place in FY1997.

Database/Application:	Automated Record Management System (ARMS)
Software:	Versatile
Hardware:	PC DOS
Location:	Admin/Info Resources
Batch/Online Status:	Online update/inquiry
Est. Physical Storage Req.:	533 Mb. This will grow as record series are added.
Application Description:	Automated Record Management System (off the shelf package)
GIS Data Classification:	None
Sharing:	No

Database/Application:	Employee Timesheet System (ETS)
Software:	APPX
Hardware:	IBM 970
Location:	Admin/Financial Administration
Batch/Online Status:	Batch, online update/inquiry
Est. Physical Storage Req.:	1.8 Gb with annual growth of 250 Mb
Application Description:	Provides entry of employee timesheets, tracks project and leave balances for employees.
GIS Data Classification:	None
Sharing:	No
Future Plans:	Install APPX upgrades as necessary. Modify to meet requirements of the TNRCC policy or legislative action.

Database/Application:	Human Resources Information System (HRIS)
Software:	FoxPro
Hardware:	PC DOS
Location:	Exec/Human Resources
Batch/Online Status:	Batch, online update/inquiry
Est. Physical Storage Req.:	460,000 Kb
Application Description:	Purchased and customized software package providing general information about employees; tracks job positions and applicants.
GIS Data Classification:	None
Sharing:	No
Future Plans:	System is being utilized again since USPS does not meet all customer needs; planned enhancements will include information about career ladders/paths.

Database/Application:	Automated Budget System (ABS)
Software:	Paradox
Hardware:	PC DOS
Location:	Admin/Budget
Batch/Online Status:	Online update/inquiry
Est. Physical Storage Req.:	120 Mb per fiscal year
Application Description:	Provides means to prepare operating budget, contains strategic planning goals.
GIS Data Classification:	None
Sharing:	No
Future Plans:	Functionality will be replaced by budget module in new OGF package currently being installed.

Database/Application:	Supply Inventory
Software:	Micro Focus COBOL/Oracle
Hardware:	Pyramid
Location:	Admin/Support Services
Batch/Online Status:	Batch, online update/inquiry
Est. Physical Storage Req.:	606 Tracks
Application Description:	Inventory of consumable supplies (paper, pencils, etc.)
GIS Data Classification:	None
Sharing:	No
Future Plans:	Functionality will be replaced when OGF is installed.

Database/Application:	Prophecy Accounts Receivable

Software:	Ingres ABF (package software)
Hardware:	HP 735
Location:	Information Resources
Batch/Online Status:	Batch and online
Est. Physical Storage Req.:	16 Gb
Application Description:	Supports billing, cash receipts and receivables functions in Accounting
GIS Data Classification:	None
Sharing:	A/R data are manually entered into USAS.
Future Plans:	Install upgrade releases from vendor approximately twice a year; planned enhancements include automated interface to USAS, streamline interfaces from other program area databases/applications.

Database/Application:	Occupational Certification System (3rd quarter FY1997)
Software:	Paradox 4.5
Hardware:	Novell Server and PC Client
Location:	Information Resources
Batch/Online Status:	Online update/inquiry
Est. Physical Storage Req.:	261 Mb, 6 Mb per year growth; 1.3 Gb on DB server
Application Description:	Maintain applicant information including name, address, employer, billing, and exam results. This system will replace the following systems: Backflow Prevention Assembly Testers, Landscape Irrigators/Installers, LPST Corrective Actions Specialists, Municipal Solid Waste Technicians, On-site Sewage Facility Installers, Residential Water Treatment Facility Operators, Stage II Vapor Recovery Representatives, Underground Storage Tank Contractors and On-site Supervisors, Visible Emissions Evaluators, Wastewater Operators and Operations Companies, Water Pump Installers, Water Well Drillers, Waterworks Operators, Operations Companies, and Customer Service.
GIS Data Classification:	None
Sharing:	License information is shared with the Attorney General for Child Support Compliance Enforcement.

Database/Application:	Boat Certification
Software:	Paradox for Windows
Hardware:	Windows 3.1 PC
Location:	Information Resources; FO Server
Batch/Online Status:	Online
Est. Physical Storage Req.:	3 Mb

Application Description:	Maintain registration information for boats with sanitary facilities.
GIS Data Classification:	None
Sharing:	License information is shared with the Attorney General for Child Support Compliance Enforcement.

Database/Application:	Multi-LIMS Laboratory Information Management System
Software:	Ingres ABF, ReportSmith
Hardware:	IBM RS 6000 Application Server
Location:	Houston Laboratory
Batch/Online Status:	Online inquiry and update, batch update
Est. Physical Storage Req.:	1 Gb
Application Description:	Automated data analysis of water samples, including connections with laboratory instruments.
GIS Data Classification:	None
Sharing:	Load data into SWQM/TRACS
Future Plans:	Installation of new releases annually plus review for year 2000 compliance. EDI transfer of lab results will be explored in FY1998.

Database/Application:	Complaints Handling System
Software:	Paradox 4.01
Hardware:	MS DOS PC
Location:	Central Office LAN, Regional Offices; FO Server
Batch/Online Status:	Online update/inquiry, batch update
Est. Physical Storage Req.:	200 Mb Central Office + each region varies (Average is 15 Mb with Houston having 50 Mb)
Application Description:	Store and track the resolution of complaints filed by the public.
GIS Data Classification:	None
Sharing:	Local programs in Houston, Arlington, and El Paso send complaint data to the TNRCC regional offices for inclusion in central complaint database. Under an EPA grant, five air local programs in Houston, Arlington, and El Paso handle complaints within their jurisdictions and enter complaint data into the Complaint Handling System.

Database/Application:	Non-Continuous Air Monitoring
Software:	Unisys DMS-II
Hardware:	Unisys A6-KX
Location:	Central Office
Batch/Online Status:	Batch and online update/inquiry
Est. Physical Storage Req.:	25 Mb

Application Description:	Storage, data retrieval and analysis of air pollutant concentration data from non-continuous air monitoring stations.
GIS Data Classification:	This database does not contain information usable in a statewide GIS.
Sharing:	Information from this database is reported to EPA.
Planned Conversion:	Migration to open systems platform is underway.

Database/Application:	Point Source Database (PSDB)
Software:	Unisys DMS-II
Hardware:	Unisys A6-F and A6-KX
Location:	Central Office
Batch/Online Status:	Batch and online update/inquiry
Est. Physical Storage Req.:	825 Mb
Application Description:	Centralized repository for point source information used by several application systems.
GIS Data Classification:	This database does contain information usable in a statewide GIS. Specifically, source and perm level latitude/longitude.
Sharing:	Under an EPA grant, five air local programs in Houston, Arlington, and El Paso perform investigations within their jurisdictions and enter investigation data into the PSDB.
Planned Conversion:	Migration to open systems platform is underway.

Database/Application:	Basic and Enhanced Tail Pipe Exhaust Inspection and Maintenance
Software:	Informix, two applications
Hardware:	Hewlett Packard Server
Location:	Central Office
Batch/Online Status:	Batch update, batch and online inquiry
Est. Physical Storage Req.:	1.5 Gb
Application Description:	Store, summarize, and report basic and enhanced data collected from vehicle tail pipe exhaust emissions tests conducted during vehicle inspections in counties which are nonattainment for ozone.
GIS Data Classification:	This database does not contain information usable in a statewide GIS.
Sharing:	Information from this database is reported to EPA.

Database/Application:	Air Quality
Software:	Unisys DMS-II
Hardware:	Unisys A6-KX
Location:	Central Office
Batch/Online Status:	Online and batch update/inquiry
Est. Physical Storage Req.:	700 Mb

Application Description: Ambient air monitoring database for air quality applications.
GIS Data Classification: This database does not contain information usable in a statewide GIS.
Sharing: Information from this database is reported to EPA.
Planned Conversion: Will be migrated to open systems platform.

Database/Application: Administrative Penalties
Software: Paradox DOS
Hardware: PC DOS
Location: Admin/Revenues
Batch/Online Status: Online update/inquiry
Est. Physical Storage Req.: Under development
Application Description: Store and report administrative penalties data.
GIS Data Classification: This database does not contain information usable in a statewide GIS.
Sharing: None
Future: Project in progress to automate transfer of data from Enforcement database to Prophecy A/R.

Application: Permits
Software: ESI Genpulse
Hardware: Unisys A6-F and A6-KX
Location: Central Office
Batch/Online Status: Online and batch update/inquiry
Application Description: Store and retrieve information in the PSDB regarding permitted sources.
Planned Conversion: Migration to open systems platform underway.

Application: Emissions Inventory
Software: ESI Genpulse
Hardware: Unisys A6-F and A6-KX
Location: Central Office
Batch/Online Status: Batch and online update/inquiry
Application Description: Store and retrieve information in the PSDB regarding emissions inventories.
Planned Conversion: Migration to open systems platform underway.

Application: Enforcement
Software: ESI Genpulse
Hardware: Unisys A6-F and A6-KX

Location: Central Office
Batch/Online Status: Batch and online update/inquiry
Application Description: Store and retrieve information in the PSDB regarding enforcement activities related to permitted sources.
Planned Conversion: Migration to open systems platform underway.

Application: Upset Maintenance
Software: ESI Genpulse
Hardware: Unisys A6-F and A6-KX
Location: Central Office
Batch/Online Status: Batch and online update/inquiry
Application Description: Store and retrieve information in the PSDB regarding accidental or unscheduled release of pollutants from a permitted source which exceeds the terms of the permit.
Planned Conversion: Migration to open systems platform underway.

Application: Source Summary
Software: ESI Genpulse
Hardware: Unisys A6-F and A6-KX
Location: Central Office
Batch/Online Status: Batch and online inquiry
Application Description: Retrieve a variety of information in the PSDB regarding permitted sources.
Planned Conversion: Migration to open systems platform underway.

Application: CAMS Data Acquisition
Software: COBOL
Hardware: Unisys A6-KX
Location: Central Office
Batch/Online Status: Batch update

Application Description: Collect ambient air quality data from instruments in the CAMS and transfer it to the central office mainframe.
Planned Conversion: Migration to open systems platform underway.

Application: CAMS Data Reporting
Software: COBOL
Hardware: Unisys A6-KX

Location: Central Office
Batch/Online Status: Batch inquiry
Application Description: Report ambient air quality data to EPA, other state and federal agencies, and the public.
Planned Conversion: Migration to open systems platform underway.

Application: CAMS Data Quality Assurance
Software: COBOL
Hardware: Unisys A6-KX
Location: Central Office
Batch/Online Status: Batch update and inquiry
Application Description: Analyze CAMS data for accuracy and completeness.
Planned Conversion: Migration to open systems platform underway.

Application: Urban Airshed Modeling
Software: EPA Urban Airshed Model

Hardware: IBM RS 6000
Location: Central Office
Batch/Online Status: Batch
Application Description: Modeling to predict ozone concentrations in urban areas.

Application: Urban Airshed Model Data Preparation
Software: ESRI Arc/Info
Hardware: IBM RS 6000
Location: Central Office
Batch/Online Status: Batch
Application Description: Allocate emissions inventory information to geographical grid for input to urban airshed model.
GIS Data Classification: Not applicable. GIS is not used for developing map layers for future reference.

Database/Application: TRI
Software: Paradox 4.0 (DOS)
Hardware: Novell Server and PC Client
Location: Exec Server
Batch/Online Status: Annual batch download from EPA, online inquiry

Est. Physical Storage Req.:	Currently approx. 140 Mb, grows by 10 Mb per year
Application Description:	Contains self-reported data from manufacturing facilities about releases, transfers, and waste management of chemicals on the TRI list (approx 350). The first multi-media reporting system.
GIS Data Classification:	Has latitude and longitudes, which have been incorporated in a GIS coverage.
Sharing:	TRI is the first set of data mandated by Congress to be publicly available. Copies and selections from the data are routinely shared with other divisions in the TNRCC, other agencies, and the public.

Database/Application:	WRPA Information System
Software:	Paradox for Windows
Hardware:	Novell Server and PC Client
Location:	Exec Server
Batch/Online Status:	Online update/inquiry
Est. Physical Storage Req.:	Approx 75 Mb
Application Description:	Contains self-reported data from facilities that are required to report about pollution prevention plans, hazardous waste generation, and TRI releases.
GIS Data Classification:	Doesn't have lat/long
Sharing:	Limited sharing within division

Database/Application:	TRI Fee Database
Software:	Paradox (3.5 or 4.0)
Hardware:	Novell Server and PC Client
Location:	Exec Server
Batch/Online Status:	Online updates and reports
Est. Physical Storage Req.:	15 Mb
Application Description:	Contains facility address and number of chemicals reported under TRI. Used to generate invoices for TRI reporting.
GIS Data Classification:	None
Sharing:	No

Database/Application:	Small Business Advocate
Software:	Paradox for Windows 5.0
Hardware:	Novell Server; Client is PC running Windows 3.1 or Windows 95
Location:	Exec Server Volume SYS

Batch/Online Status:	Online add/delete/edit/update/inquiry and reports
Est. Physical Storage Req.:	Currently approx. 80 Mb, grows by 6 Mb per year. Paradox needs 80 Mb of hard drive.
Application Description:	Reports, labels, and envelopes for inquiries about small businesses. In FY1996, converted to Windows; redesigned customer interface, improved reports; added ad hoc reporting; improved search function; added levels of security.
GIS Data Classification:	Doesn't have lat/long
Sharing:	Accessible by Small Business Advocate's staff only.

Database/Application:	Proposition Two
Software:	Paradox 4.02 (DOS)
Hardware:	PC DOS Microcomputer
Location:	RULES Server Volume SYS
Batch/Online Status:	Online add/delete/edit/update/inquiry/print letters and reports
Est. Physical Storage Req.:	Currently approx. 5 Mb, grows by 2 Mb per year. Paradox needs 80 Mb of hard drive.
Application Description:	Proposition Two System (PROP2) maintains a database to process and track Use Determination applications received by the Prop 2 section of the Chief Engineer's Office. This application has three fee levels: (a) Tier I Pre-Determinations/100 percent and Partial = $100 fee (b) Tier II Non Pre-Determinations/100 percent = $500 fee (c) Tier III Non Pre-Determinations/Partial = $1,000 fee.
GIS Data Classification:	Doesn't have lat/long
Sharing:	Accessible by Chief Engineer's Office only.

Database/Application:	GIS Certified Data
Software:	ArcInfo
Hardware:	HP 9000 Workstation Server
Location:	Central Office Network
Batch/Online Status:	Available for read only
Est. Physical Storage Req.:	6 Gb
Application Description:	GIS data sets contained in the “Certified GIS Map Layer Catalog”
GIS Data Classification:	Series III Layers - Texas Outline, TNRCC Service Regions, Counties, Cities, Census, Blocks, Census Block Groups, Highways, Roads, Streams, Lakes, Designated Stream Segments, Stream Segment Boundaries, Major Streams Series IV Layers -

U.S./Mexico State Outlines, Texas Outline, Major Cities, Major Highways, Major Streams, Major Water Bodies, State-Level Soil Associations, Ecoregions, USGS Hydrological Units, TNRCC River Basins, Major Aquifers, Minor Aquifers, Rio Grande Basin Outline, Rio Grande Basin Hydrology, Toxic Release Inventory, Superfund Sites, Municipal Solid Waste Landfills, Air Quality Monitoring Stations, Water Rights, Surface Water Quality Monitoring Points
Raster Data -
Digital Raster Graphics (DRG) files for Texas-Mexico border and San Antonio-Nueces coastal watershed. (Scanned USGS 7.5 minute quad maps)
Digital orthophoto quarter quads (DOQQ) for San Antonio-Nueces coastal watershed. Color Infrared at 1:24 scale.

Sharing: Data is available to other agencies via FTP and TNRCC web site.

Database/Application: Water Utilities
Software: Micro Focus COBOL/Oracle
Hardware: Pyramid Nile 150
Location: Information Resources
Batch/Online Status: Online update/inquiry, batch
Est. Physical Storage Req.: 10 Mb
Application Description: Maintain water utility information, track water utility cases, maintain annual report information, support fee billing.
GIS Data Classification: None
Sharing: No
Future Plans: Water Utilities and Public Drinking Water will be rewritten in TI Composer/Oracle.

Database/Application: Water Districts Information
Software: Micro Focus COBOL/Oracle
Hardware: Pyramid Nile 150
Location: Information Resources
Batch/Online Status: Online update/inquiry
Est. Physical Storage Req.: 7.9 Mb
Application Description: Maintain water district information, including water districts and other authorities, officials and consultants, approved bond issues, and details of operations; tracks audit reports.
GIS Data Classification: Maintains latitude and longitude
Sharing: No
Future Plans: Water Districts information will be rewritten in TI Composer/Oracle.

Database/Application:	Water District Applications
Software:	Micro Focus COBOL/Oracle
Hardware:	Pyramid Nile 150
Location:	Information Resources
Batch/Online Status:	Online update/inquiry, batch
Est. Physical Storage Req.:	2.4 Mb
Application Description:	Track and report on water district applications, including creations, bond issues, general, and miscellaneous.
GIS Data Classification:	None
Sharing:	No

Future Plans: Water Districts applications will be rewritten in TI Composer/Oracle.

Database/Application:	Public Water Supply Inventory (Public Drinking Water System)
Software:	FoxPro
Hardware:	LAN
Location:	Water Utilities, Monitoring & Enforcement
Batch/Online Status:	Online update/inquiry, batch
Est. Physical Storage Req.:	4 Mb
Application Description:	Maintain information on public water systems; support fee billing
GIS Data Classification:	None
Sharing:	No
Future Plans:	Public Drinking Water System will be rewritten in TI Composer/Oracle.

Application:	Sludge Transporters
Software:	Paradox 4.0 (DOS)
Hardware:	PC & Novell Network
Location:	WQ Network Server
Batch/Online Status:	Online update/inquiry, reports, billing
Est. Physical Storage Req.:	500 Kb
Application Description:	A set of database tables used for tracking, registering and billing haulers of sludge and municipal solid waste
GIS Data Classification:	None
Sharing:	No

Application: Land Application Beneficial Use System

Software :	Paradox 4.0 (DOS)
Hardware:	PC & Novell Network
Location:	WQ Network Server
Batch/Online Status:	Online update/inquiry, reports, billing
Est. Physical Storage Req.:	6 Mb
Application Description:	Interactive application contains information about individual beneficial land sites, site owners, land owners, sludge sources, self-reporting data, etc. Tracks applications for registered sites. Creates input files to AR System for billing.
GIS Data Classification:	None
Sharing:	No

Application:	Watermaster Water Accounting and Assessment Billing
Software:	PC/Focus
Hardware:	PC
Location:	San Antonio (South Texas), McAllen (Rio Grande) and Eagle Pass (Rio Grande)
Batch/Online Status:	Online update/inquiry/report request
Est. Physical Storage Req.:	~15 Mb (South Texas), ~25 Mb (Rio Grande-Weslaco), ~8 Mb (Rio Grande-Eagle Pass) = ~48 Mb total
Application Description:	Maintains water accounts and owners, tracks water use, supports assessment fee billing
GIS Data Classification:	None
Sharing:	No

Application:	Compliance Schedule Monitoring System
Software:	Paradox 4.0 PAL
Hardware:	IBM Compatible PC
Location:	Water Rights
Batch/Online Status:	Online inquiry/update
Est. Physical Storage Req.:	5 Mb
Application Description:	Tracks technical requirements, penalties and enforcement actions for water rights permits. Allows adds, edits and updates of enforcement cases for individual enforcement coordinators as well as for all cases. Reports of these enforcement cases can be generated.
GIS Data Classification:	None
Sharing:	No

Database/Application:	Texas Clean Rivers Program Screening Application

Software:	Paradox 4.0 PAL
Hardware:	IBM Compatible PC
Location:	Water Rights
Batch/Online Status:	Online inquiry
Est. Physical Storage Req.:	20 Mb
Application Description:	Generates summary statistics of water quality data. Information is used by Texas River Authorities in reporting to the TNRCC.
GIS Data Classification:	Contains GIS data
Sharing:	Data is transferred on a regular basis to all the Texas River Authorities and the U.S. Geological Survey. A number of private engineering firms receive this data.

Financial applications that do not maintain databases:

Application:	Cost Recovery
Software:	Paradox
Hardware:	PC DOS
Location:	Admin/Financial Administration
Batch/Online Status:	Online update/inquiry
Est. Physical Storage Req.:	350 Mb
Application Description:	Provides cost and time reports for EPA, by budget category, for work done on grant and nongrant sites.
GIS Data Classification:	None
Sharing:	No
Future Plans:	Will need to create new interfaces from OGF (new Oracle Government Financials integrated client/server system currently being installed) and modify existing interfaces from USAS.

Application:	Labor Distribution and Transfers
Software:	Micro Focus COBOL
Hardware:	Pyramid
Location:	Admin/Financial Administration
Batch/Online Status:	Batch
Est. Physical Storage Req.:	This system creates USAS transactions. Historical files rather than a database are kept.
Application Description:	Distribute salary expenditures based on timesheet data and payroll data.
GIS Data Classification:	None
Sharing:	No
Future Plans:	Need to create new interfaces to OGF and modify existing interfaces

to USAS.

Applications the TNRCC accesses online which are maintained by other agencies

Application:	State Property Accounting (SPA)
Software:	Unknown
Hardware:	IBM compatible mainframe
Location:	Comptroller (used by Admin/Support Services)
Batch/Online Status:	Batch; online inquiry
Est. Physical Storage Req.:	See Comptroller report
Application Description:	Inventory of capital property (equipment, furniture, etc.)
GIS Data Classification:	None
Sharing:	See Comptroller report
Future Plans:	The TNRCC will develop interfaces to this system as part of the Oracle Government Financials project

Application:	Uniform Statewide Accounting System (USAS)
Software:	DB 2
Hardware:	IBM compatible mainframe
Location:	Comptroller (used by Admin/Financial Admin)
Batch/Online Status:	Batch, online inquiry
Est. Physical Storage Req.:	See Comptroller report
Application Description:	General ledger accounting system
GIS Data Classification:	None
Sharing:	See Comptroller report
Future Plans:	The TNRCC will become a reporting agency in FY1998

Application:	State Library System (SLS)
Software:	See State Library report
Hardware:	See State Library report
Location:	State Library (used by Admin/Public Outreach)
Batch/Online Status:	Batch, online inquiry
Est. Physical Storage Req.:	See State Library report
Application Description:	Catalog of library contents, provides means for tracking checking in/out of items.
GIS Data Classification:	None
Sharing:	See State Library report

Application:	Uniform Statewide Payroll System (USPS)
Software:	See Comptroller report
Hardware:	See Comptroller report
Location:	Comptroller (used by Admin/Financial Admin)
Batch/Online Status:	Batch, online inquiry
Est. Physical Storage Req.:	See Comptroller report
Application Description:	Provides payroll for employees
GIS Data Classification:	None
Sharing:	See Comptroller report

Application:	Legislative Budget Board Grants Reporting System
Software:	Lotus Notes
Hardware:	See LBB report.
Location:	PC and Server in IR used for transmitting information to LBB.
Batch/Online Status:	Batch, online inquiry
Est. Physical Storage Req.:	See LBB report
Application Description:	Transmits Federal grant activities to LBB on quarterly basis. Also submits strategic planning documents and fiscal notes to LBB.
GIS Data Classification:	None
Sharing:	See LBB report

Appendix A

TNRCC Strategic Plan - Goals and Objectives

Appendix A

TNRCC Strategic Plan - Goals and Objectives

The TNRCC Strategic Plan for Fiscal Years 1997-2001, June 1996, contains the agency Goals and Strategies. The TNRCC Information Technology Strategic Plan supports the following agency goals and objectives, shown in detail in the TNRCC Strategic Plan.

Goal 1 - Assessment, Permitting, and Prevention

To protect public health and the environment by accurately assessing environmental conditions; by preventing or minimizing the level of contaminants released to the environment through regulation and permitting of facilities or activities with potential to contribute to pollution levels; by promoting voluntary efforts to prevent pollution; and by assuring the delivery of safe drinking water to Texas citizens at affordable rates.

Objective 01

For each of the fiscal years 1997 through 2001, to review 100 percent of the air quality, water resource, and waste management permits received in a consistent and timely manner that promotes flexibility in achieving environmental goals and fosters compliance with environmental laws.

Objective 02

For the fiscal years 1997 through 2001, to protect public health and the environment consistent with sustainable economic development by continually assessing and measuring the environmental quality and quantity of our natural resources and developing appropriate policies and regulations and to review and reform existing agency rules to eliminate redundancy and assure consistency across media.

Objective 03

Promote voluntary pollution prevention and recycling to achieve by the year 2000, a reduction of 35 percent in the release of contaminants and pollutants and a decrease of 50 percent in the amount of solid waste going to landfills, measured from the 1992 levels.

Objective 04

To increase to 95 percent the number of Texans served by public drinking water systems, with drinking water that meets drinking water standards.

Goal 2 - Enforcement and Compliance Assistance

To protect public health and the environment by administering enforcement programs that promote voluntary compliance with environmental laws and regulations while providing strict, sure, and just enforcement when environmental laws are violated.

Objective 01

By fiscal year 2001, to bring 90 percent of all regulated facilities into compliance with state environmental laws and regulations and to respond appropriately to citizen inquiries and complaints.

Goal 3 - Pollution Cleanup

To protect public health and the environment by identifying, assessing, and prioritizing contaminated sites, and by assuring timely and cost-effective cleanup based on good science and current risk factors.

Objective 01

By fiscal year 2001, to identify, assess and clean up 90 percent of the known sites contaminated by hazardous materials and petroleum from leaking storage tanks.

Appendix B

TNRCC Organization Charts

Appendix C

TNRCC Local Area Network Diagram

Appendix D

TNRCC Wide Area Network Diagram

Appendix E

DIR State Strategic Plan for IRM - Goals and Objectives

Appendix E

Department of Information Resources State Strategic Plan for Information Resources Management - Goals and Objectives

The Texas Department of Information Resources (DIR) articulated the strategic goals and objectives in the 1995 State Strategic Plan for Information Resources Management in its *Facing the Future: A Vision for Information and Technologies to Serve Tomorrow's Texans* [Austin, 1995], 11-19.

DIR supports its strategic direction with the following goals and objectives:

Goal 1 Texas will integrate government services by developing, implementing, and maintaining a statewide information resources infrastructure.

- Provide access to the coordinated, interoperable communications infrastructure necessary to support state computer and videoconferencing needs.
- Develop and assist organizations that coordinate and facilitate sharing of information.
- Share a common electronic mail exchange infrastructure that ensures all agencies are reachable by electronic mail.
- Provide a standard electronic index to all state information and services, even those that are not provided electronically.
- Establish inventories, definitions, and identified custodians for all data elements in data bases.

Goal 2 Texas will adopt and apply information resources standards and guidelines.

- Ensure interoperability and connectivity between and among state and private information resource facilities.
- Ensure the privacy of citizens as required by law.
- Provide appropriate security and authentication for information and services maintained and communicated by the state.

Goal 3 Texas state government will enable sharing and interoperability

of services through common frameworks and processes.

- Harmonize and improve information resources planning within and between entities at all levels of government.
- Standardize information systems development and implementation.
- Foster exemplary management of information resources projects.

Goal 4 Texas state government information technology acquisition, use and management will be driven by the recognition and understanding of user needs.

- Provide equitable access to state-provided information and services at times and locations citizens select, taking into account special needs and social, economic, and ethic considerations.
- Ensure the availability of simple, comprehensive user interfaces to state-provided information and services.
- Ensure electronic availability for all state documents, data, and services from a variety of sources as allowable by law.
- Effect continuous availability and business recovery of the state's mission-critical information resources capabilities.